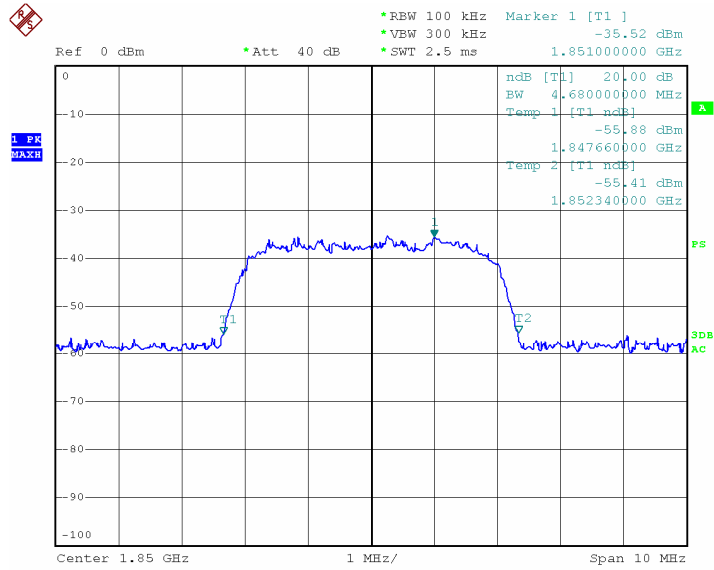
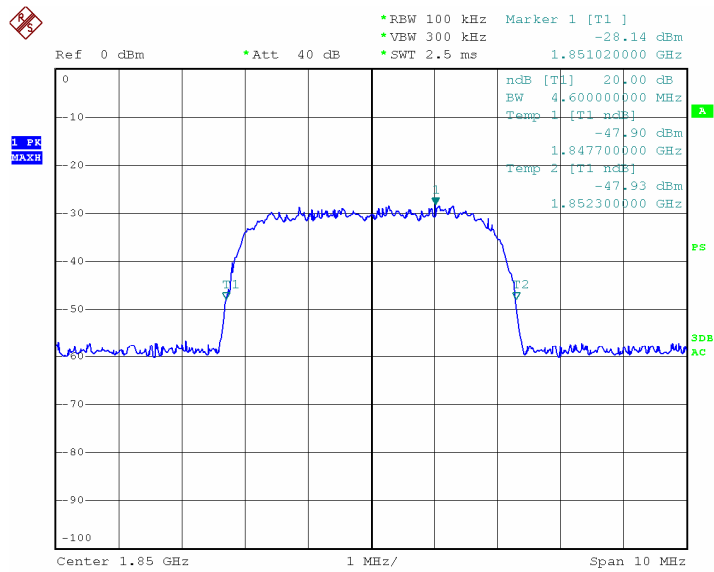


1900MHz-WCDMA uplink (lowest frequency)-Input



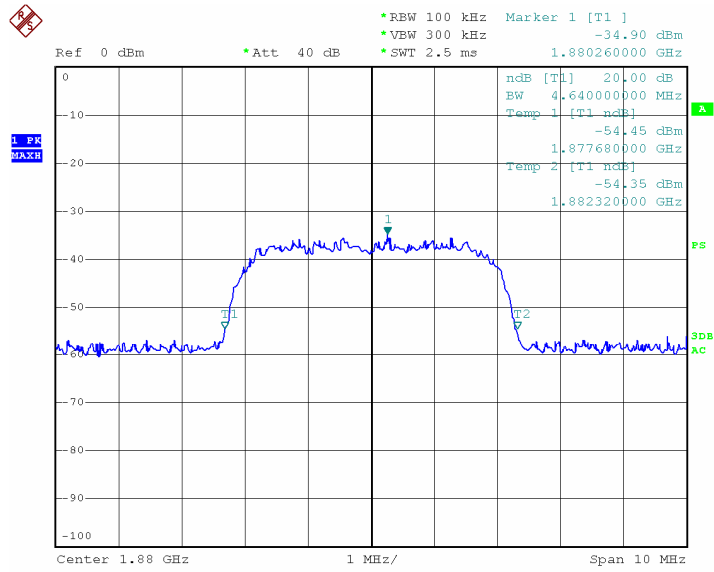
Date: 9.MAY.2012 18:24:09

1900MHz-WCDMA uplink (lowest frequency)- Output



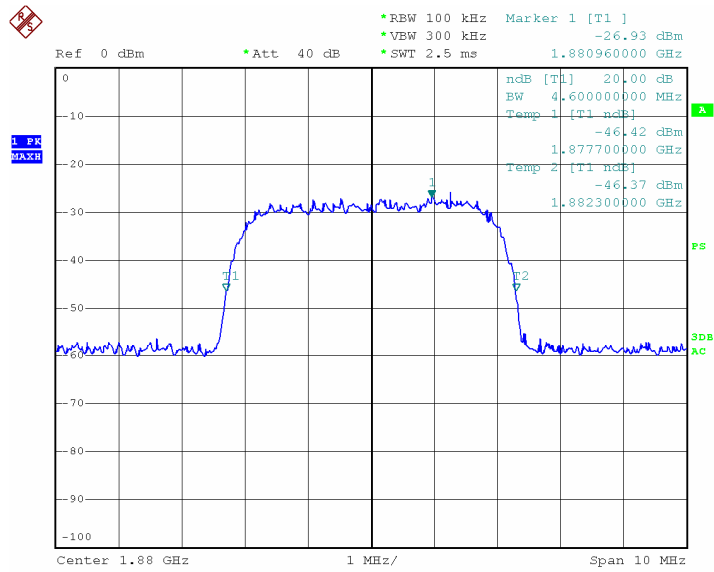
Date: 9.MAY.2012 16:49:25

### 1900MHz-WCDMA uplink (middle frequency)-Input



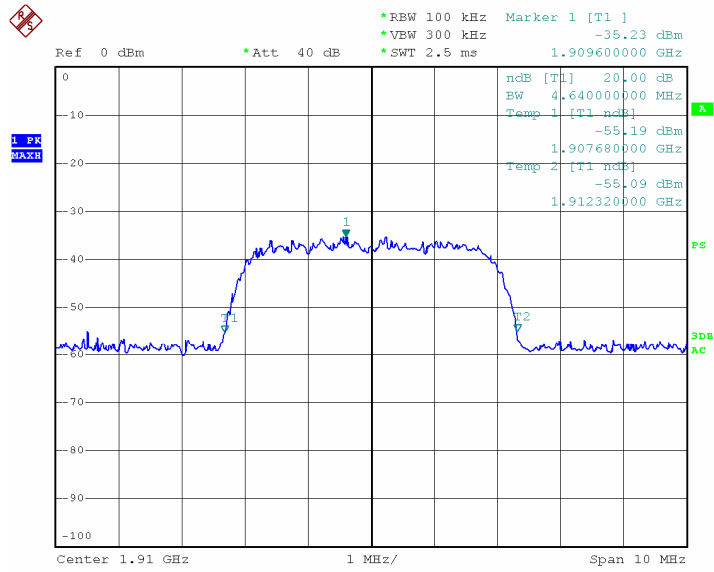
Date: 9.MAY.2012 18:24:37

### 1900MHz-WCDMA uplink (middle frequency)-Output



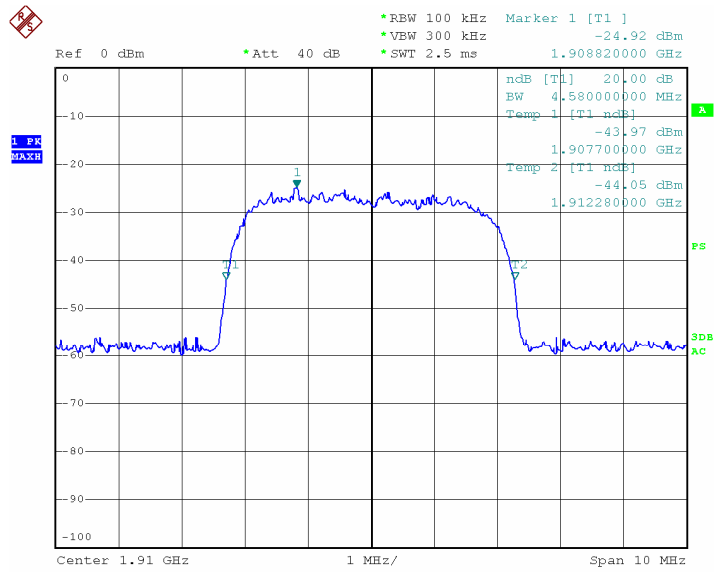
Date: 9.MAY.2012 16:49:01

19 00MHz-WCDMA uplink (highest frequency )-Input



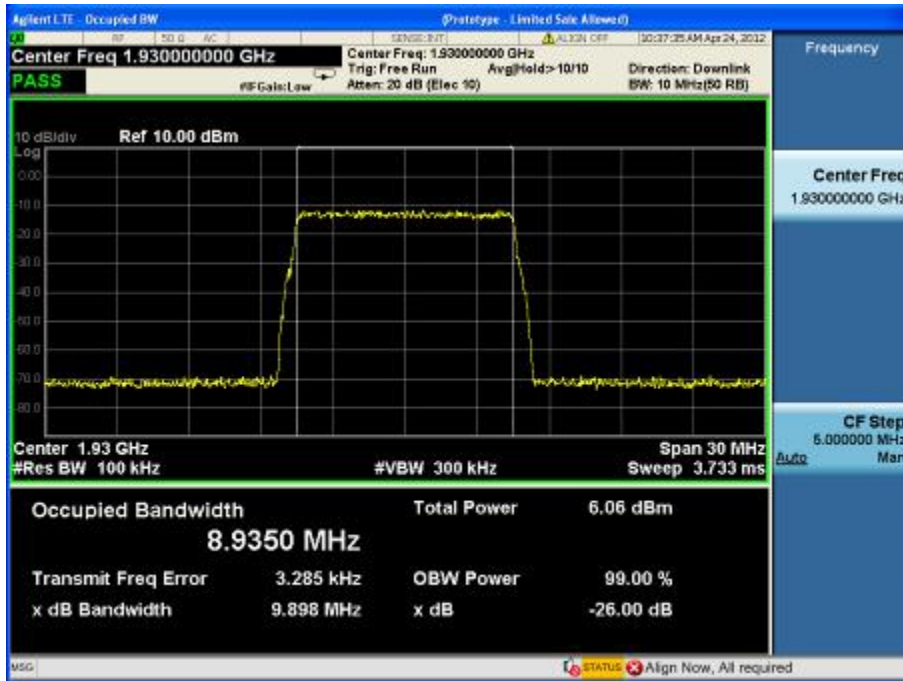
Date: 9.MAY.2012 18:25:08

1900MHz-WCDMA uplink (highest frequency)- Output

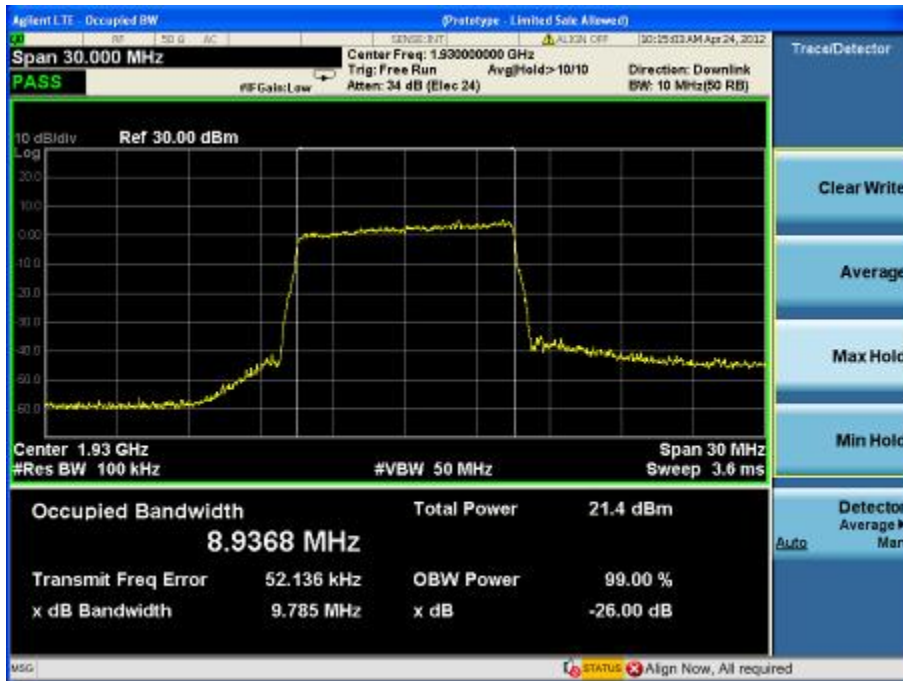


Date: 9.MAY.2012 16:48:30

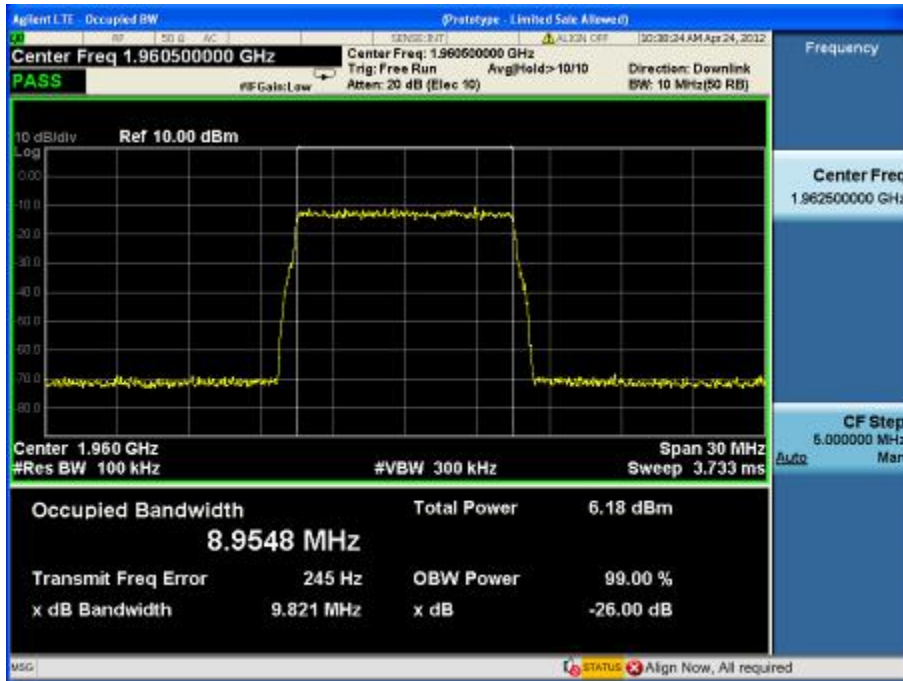
1900MHz-LTE-QPSK downlink (lowest frequency)-Input



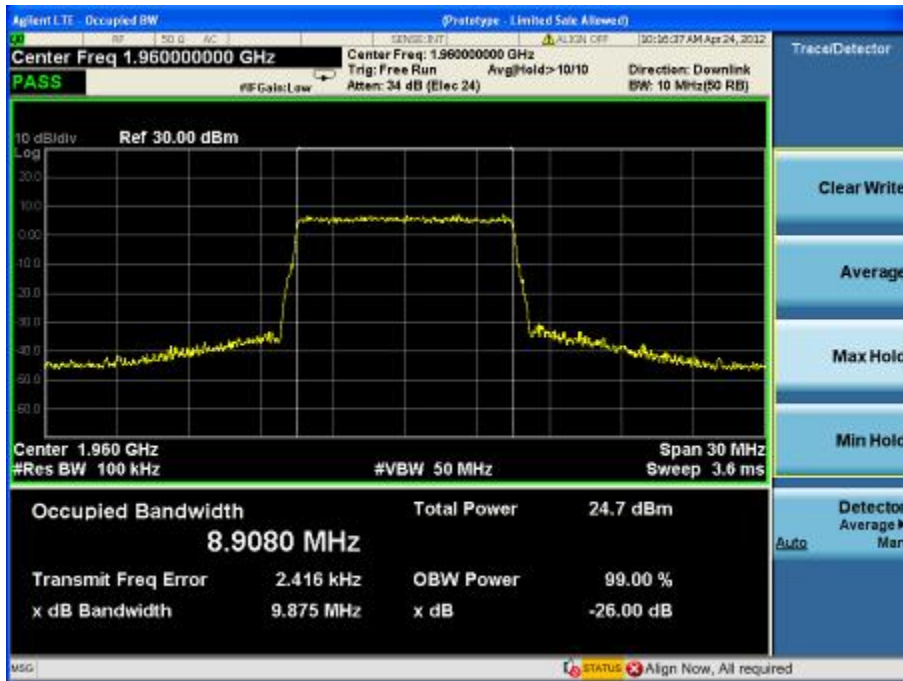
1900MHz-LTE -QPSK downlink (lowest frequency)-Output



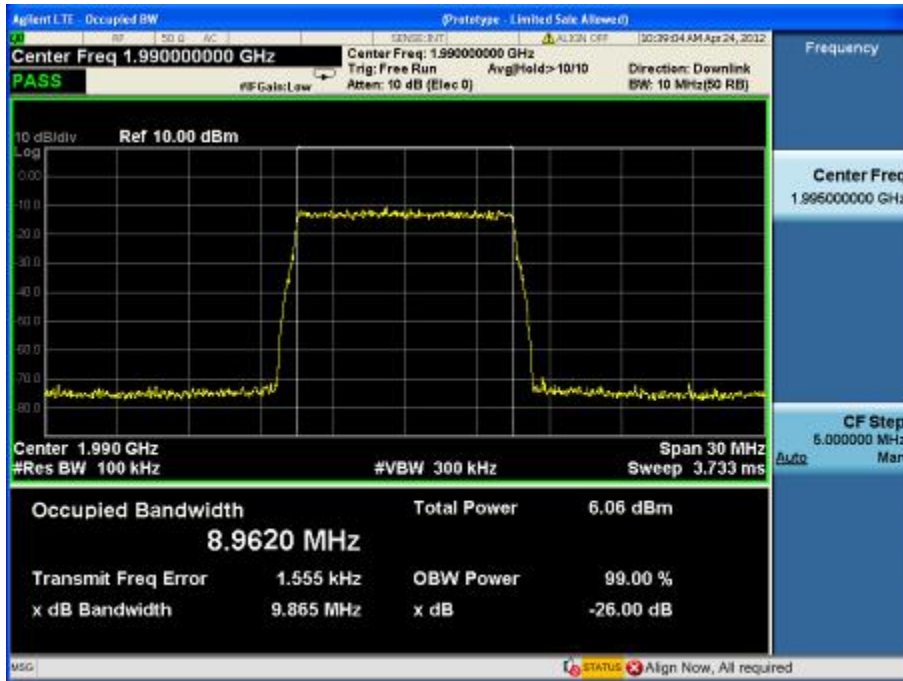
1900MHz-LTE-QPSK downlink (middle frequency)-Input



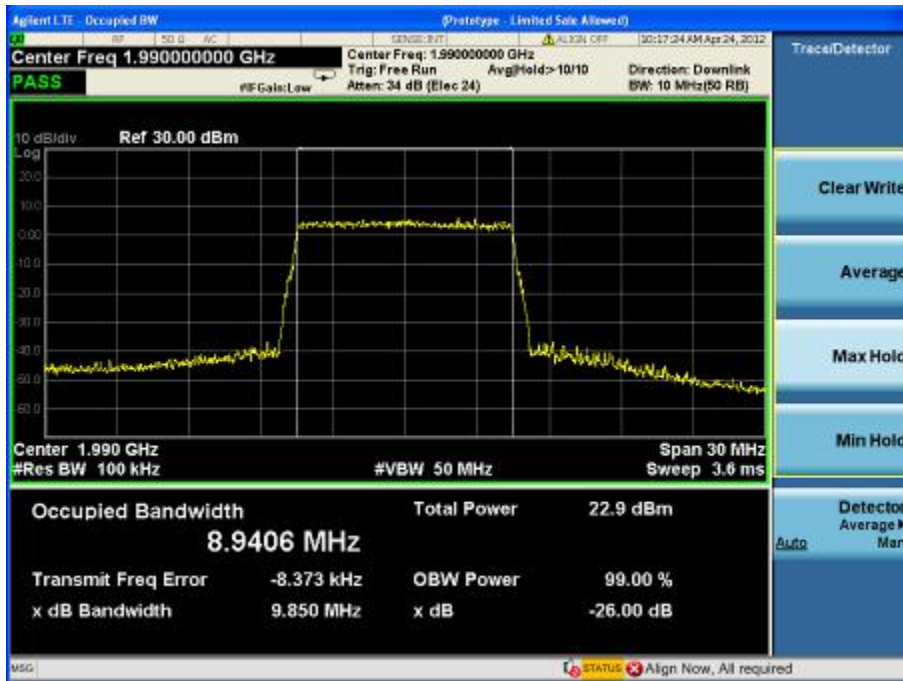
1900MHz-LTE-QPSK downlink (middle frequency)- Output



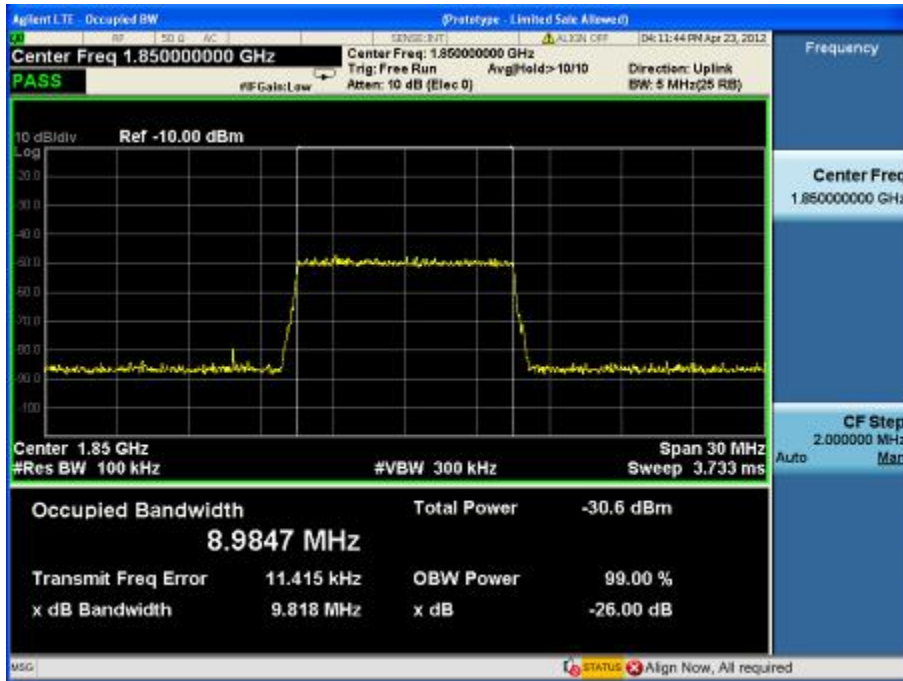
1900MHz-LTE-QPSK downlink (highest frequency )-Input



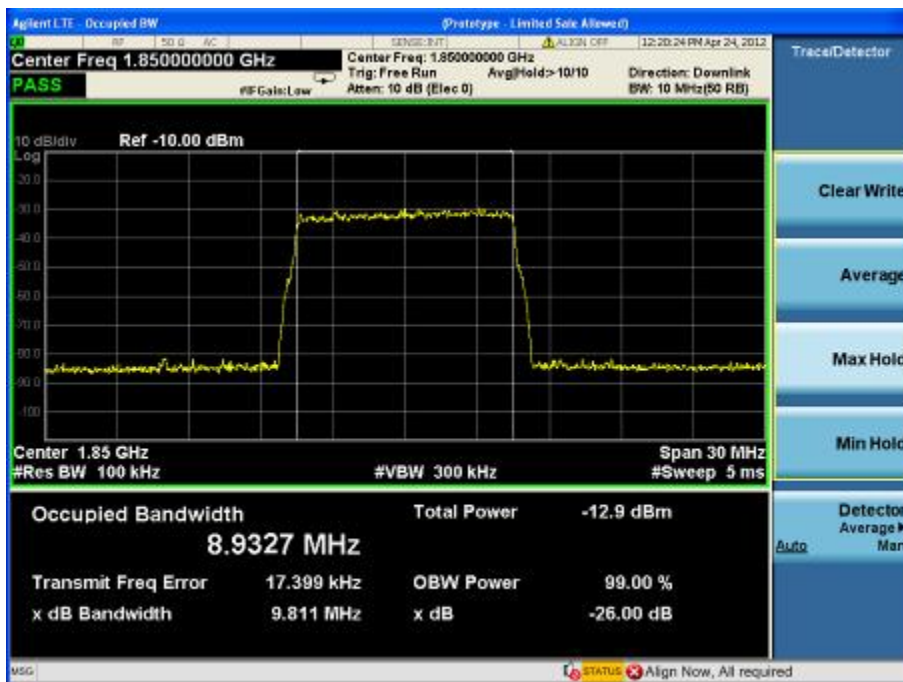
1900MHz-LTE-QPSK downlink (highest frequency)- Output



1900MHz-LTE-QPSK uplink (lowest frequency)-Input

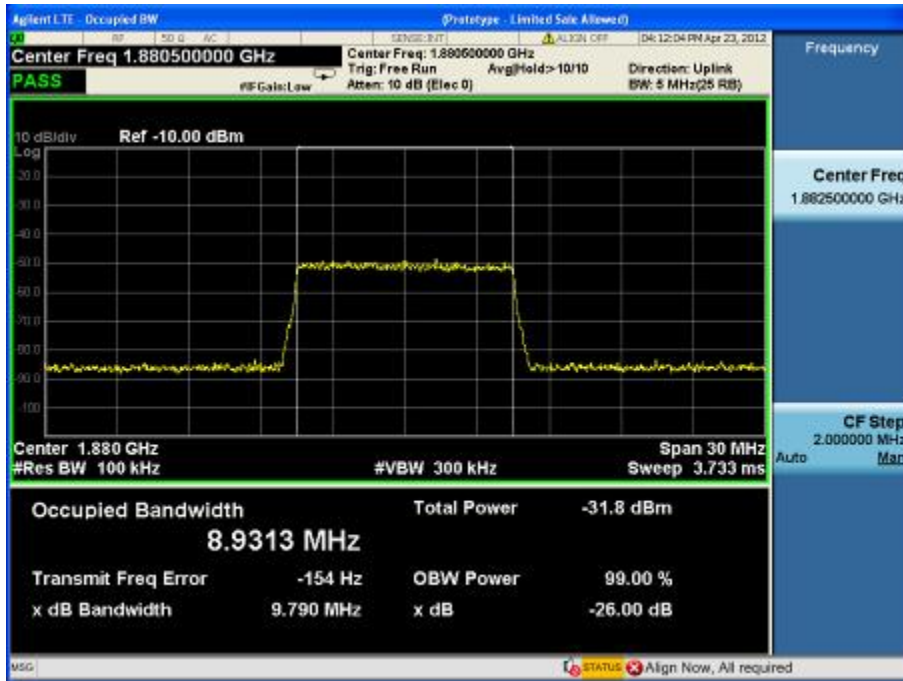


1900MHz-LTE-QPSK uplink (lowest frequency)- Output

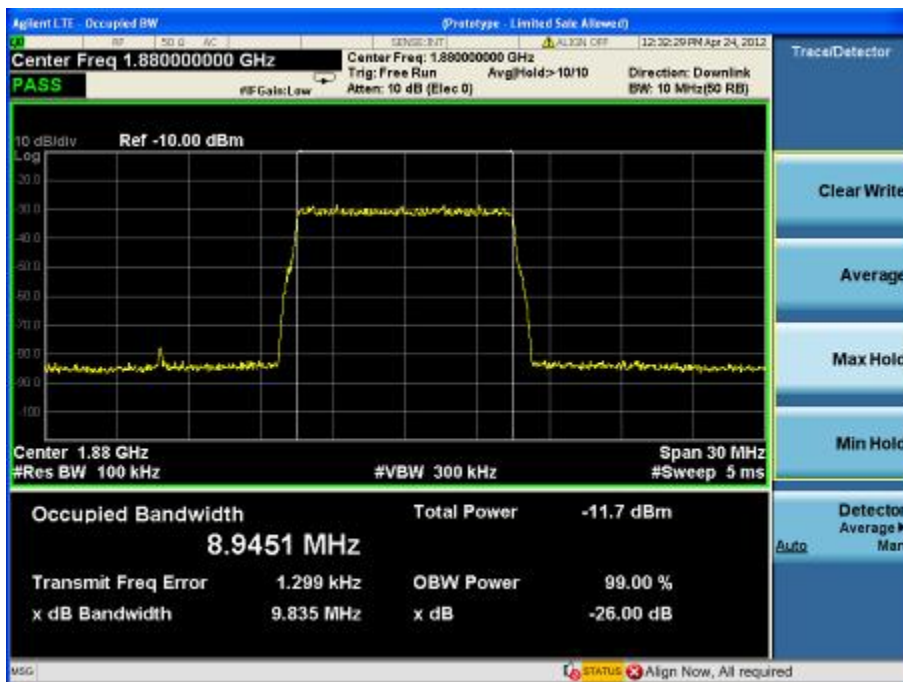




1900MHz-LTE -QPSK uplink (middle frequency)-Input

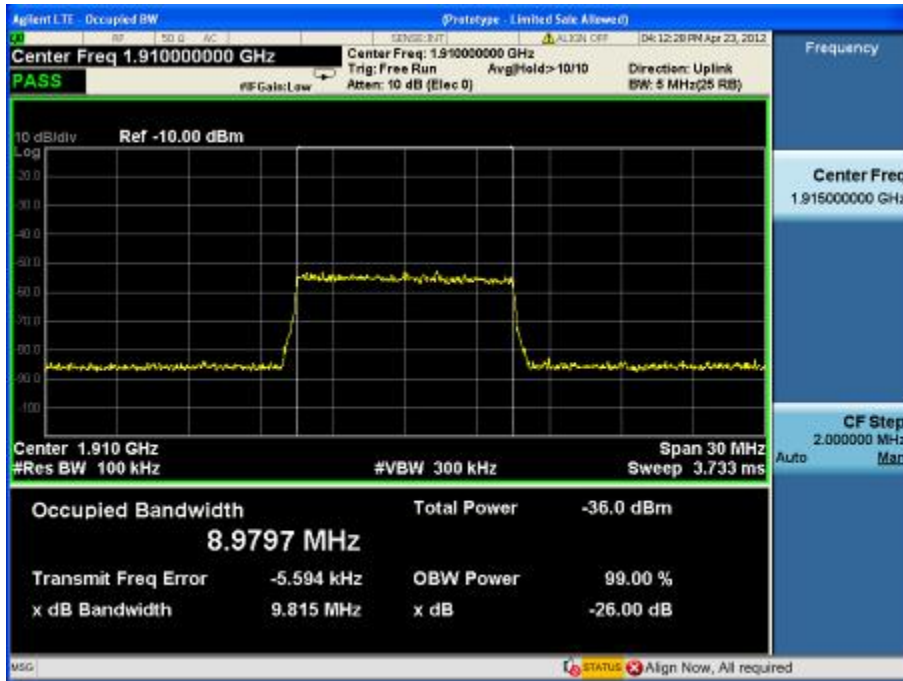


1900MHz-LTE-QPSK uplink (middle frequency)-Output

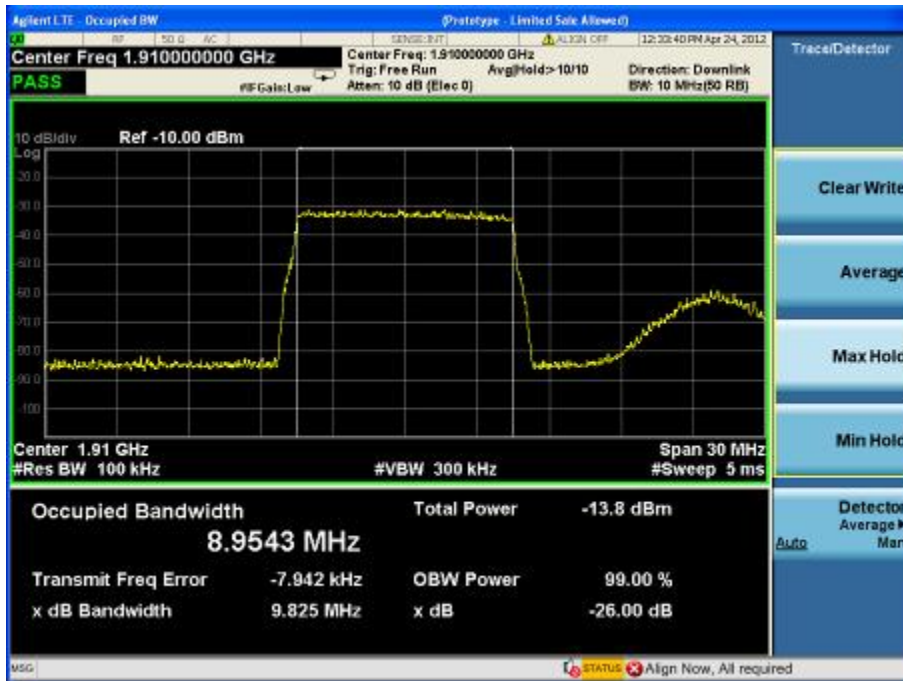




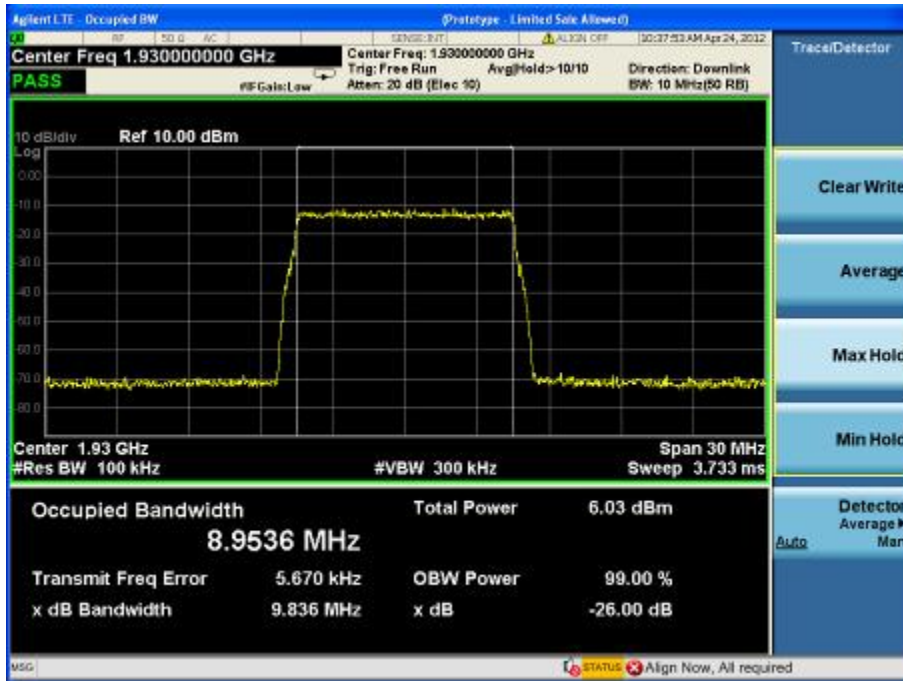
1900MHz-LTE-QPSK uplink (highest frequency )-Input



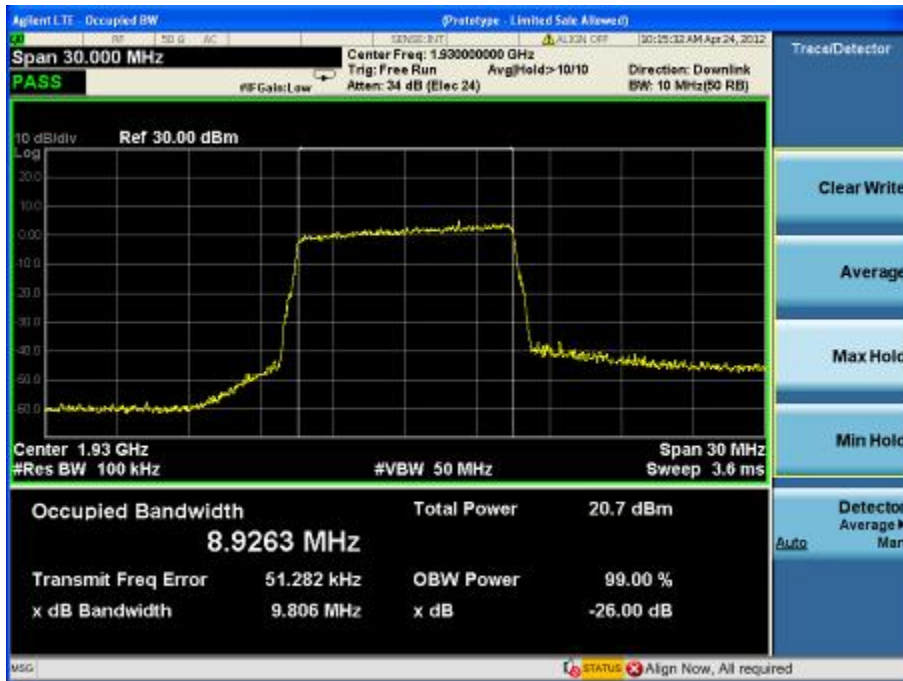
1900MHz-LTE -QPSK uplink (highest frequency)- Output



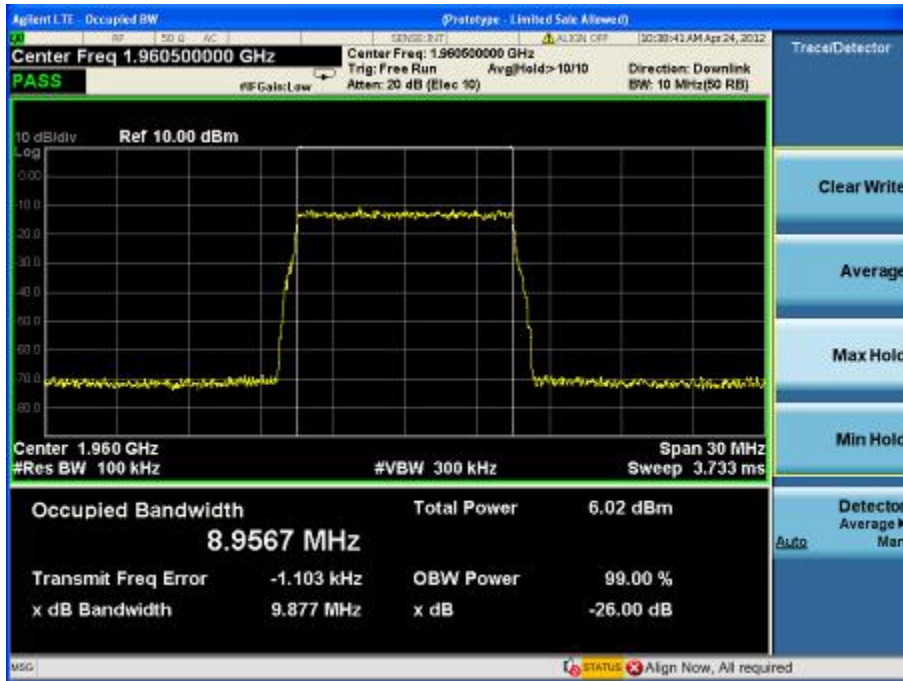
1900MHz-LTE-16QAM downlink (lowest frequency)-Input



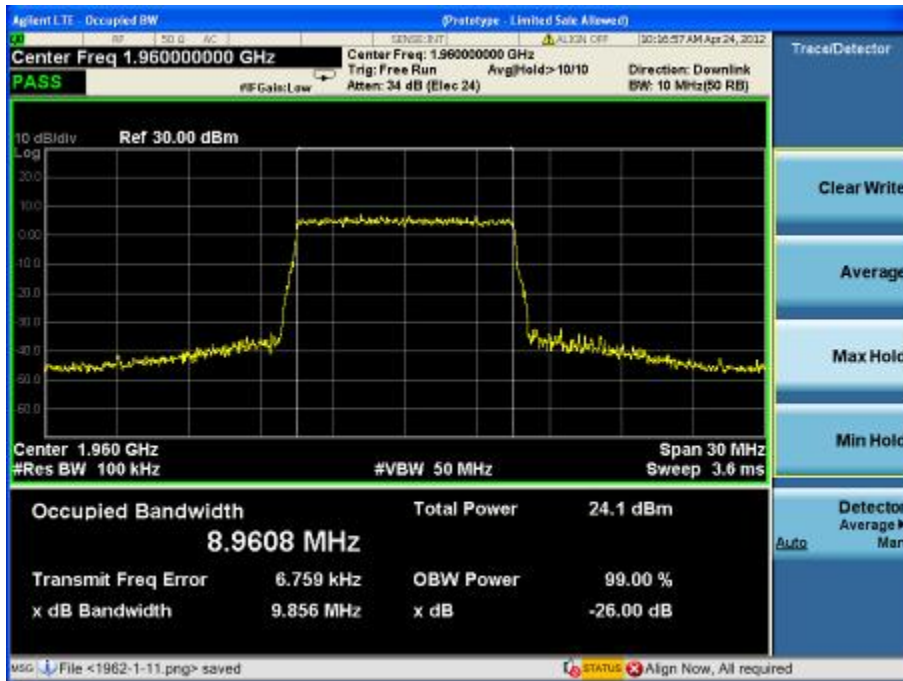
1900MHz-LTE -16QAM downlink (lowest frequency)-Output



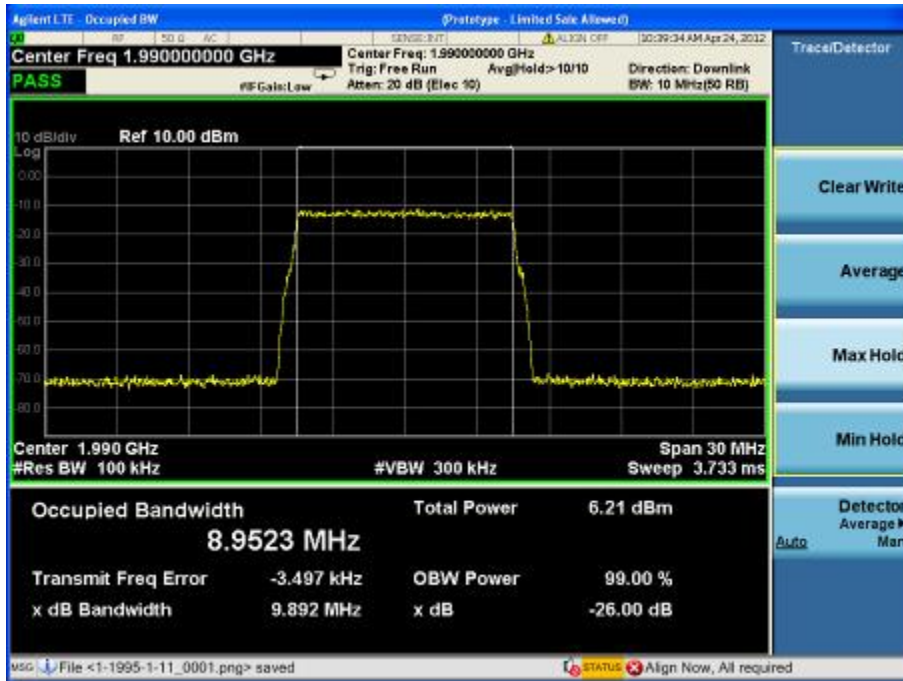
1900MHz-LTE-16QAM downlink (middle frequency)-Input



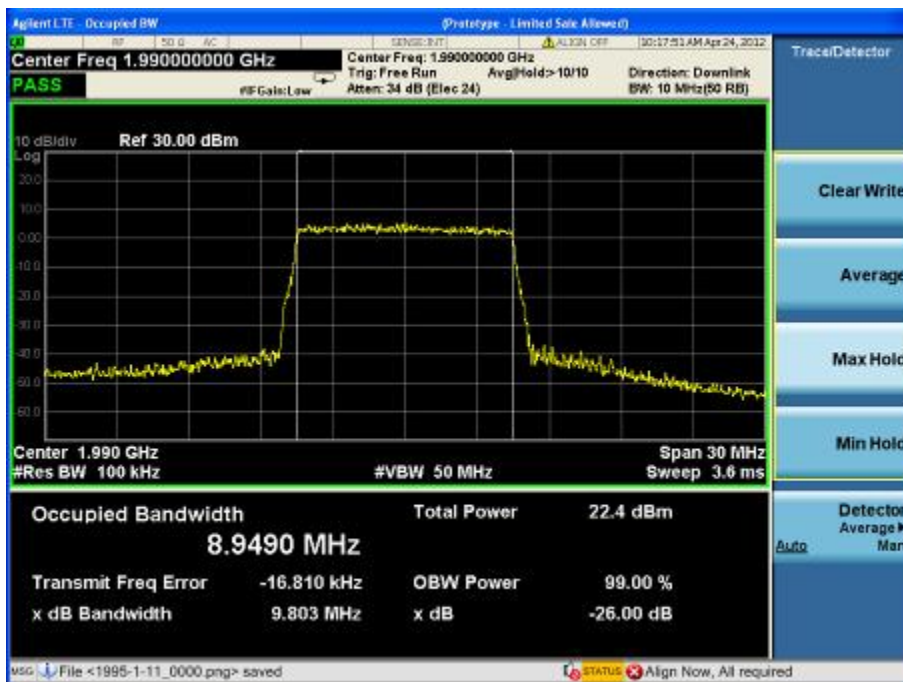
1900MHz-LTE-16QAM downlink (middle frequency)- Output



1900MHz-LTE-16QAM downlink (highest frequency )-Input

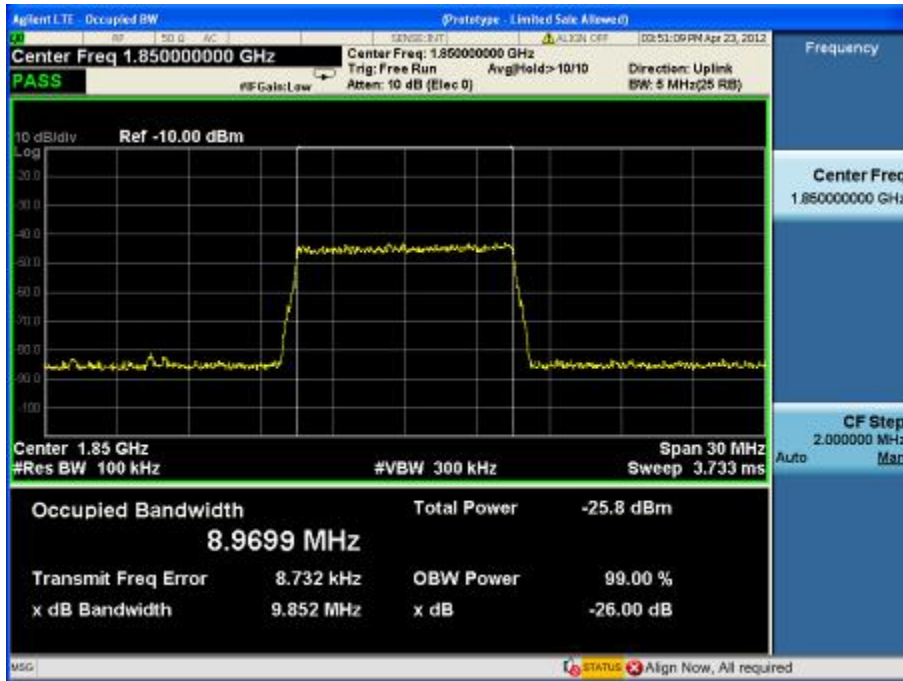


1900MHz-LTE-16QAM downlink (highest frequency)- Output

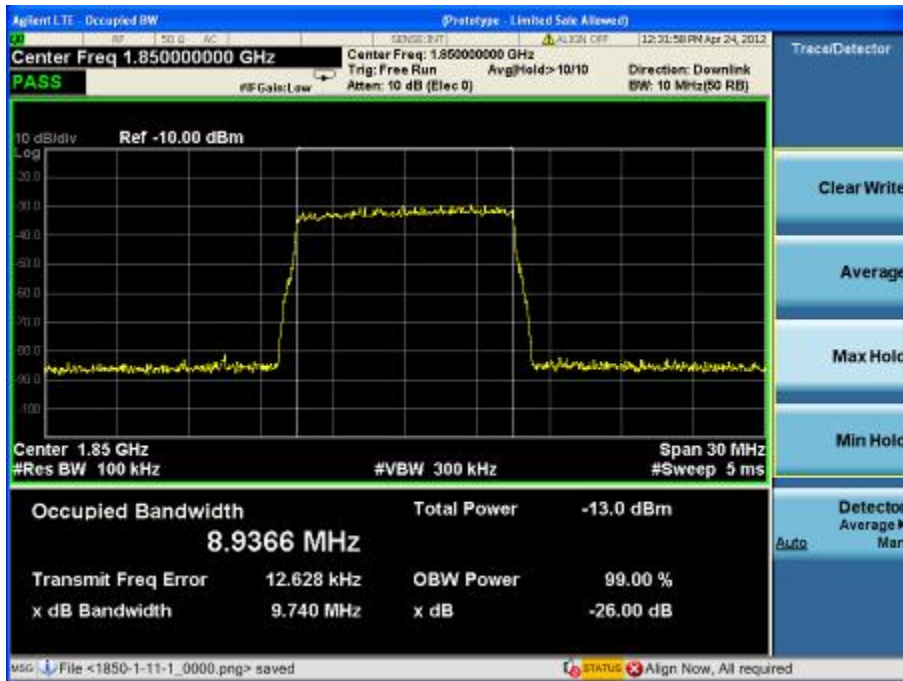




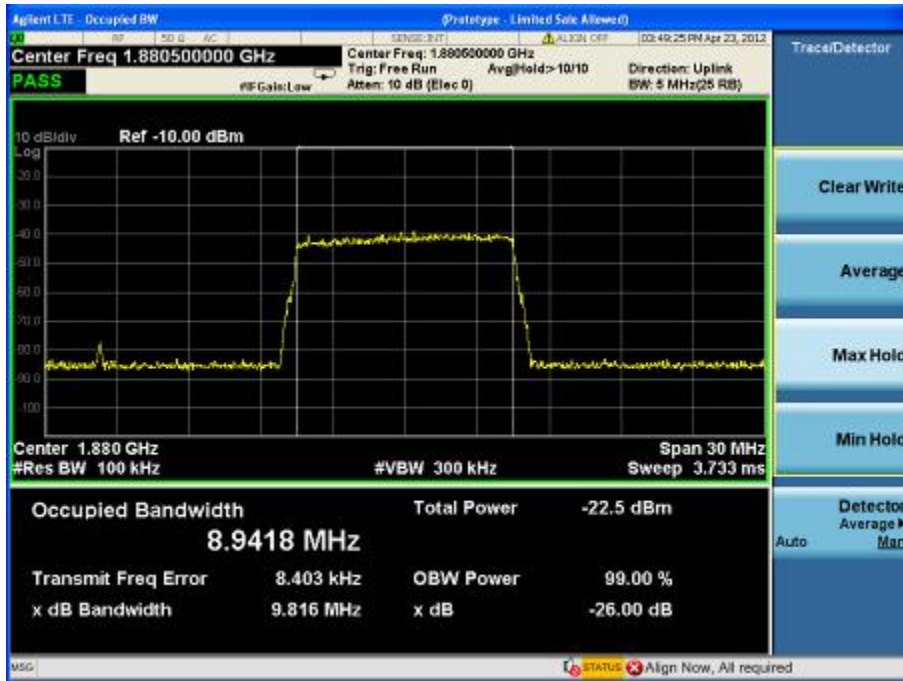
1900MHz-LTE-16QAM uplink (lowest frequency)-Input



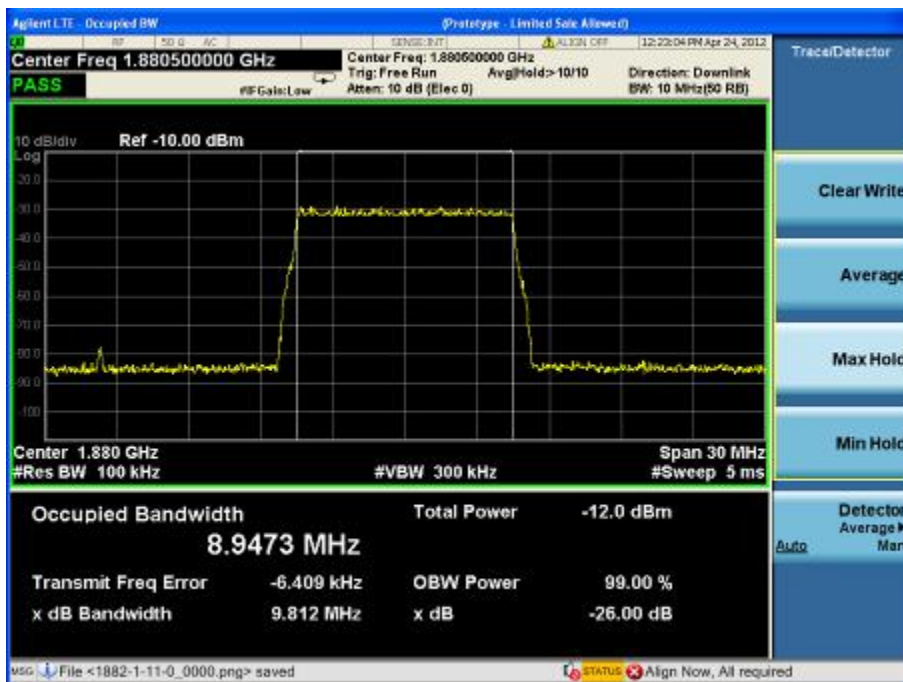
1900MHz-LTE-16QAM uplink (lowest frequency)- Output



1900MHz-LTE -16QAM uplink (middle frequency)-Input

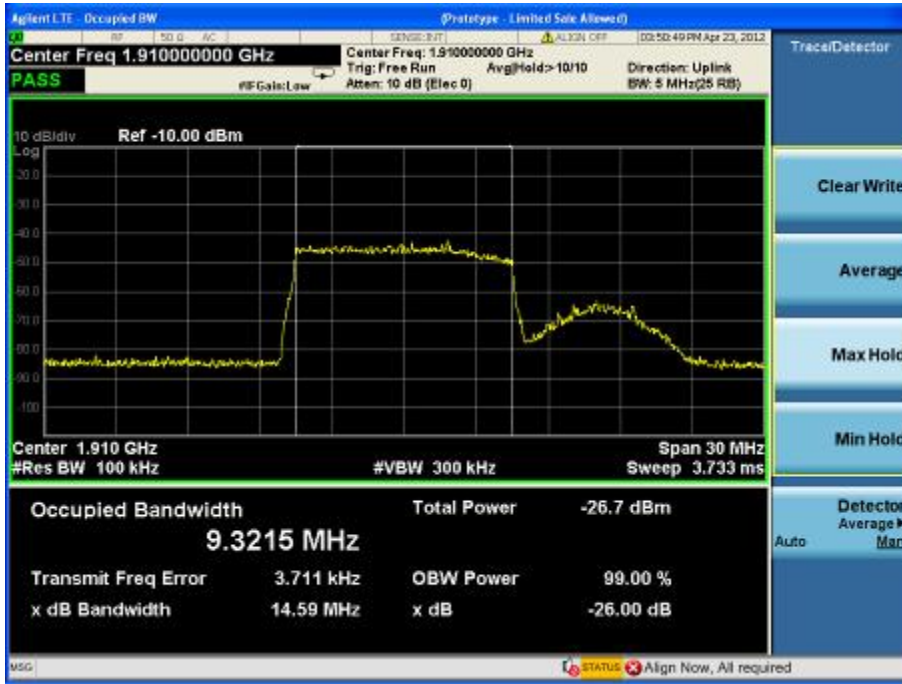


1900MHz-LTE-16QAM uplink (middle frequency)-Output

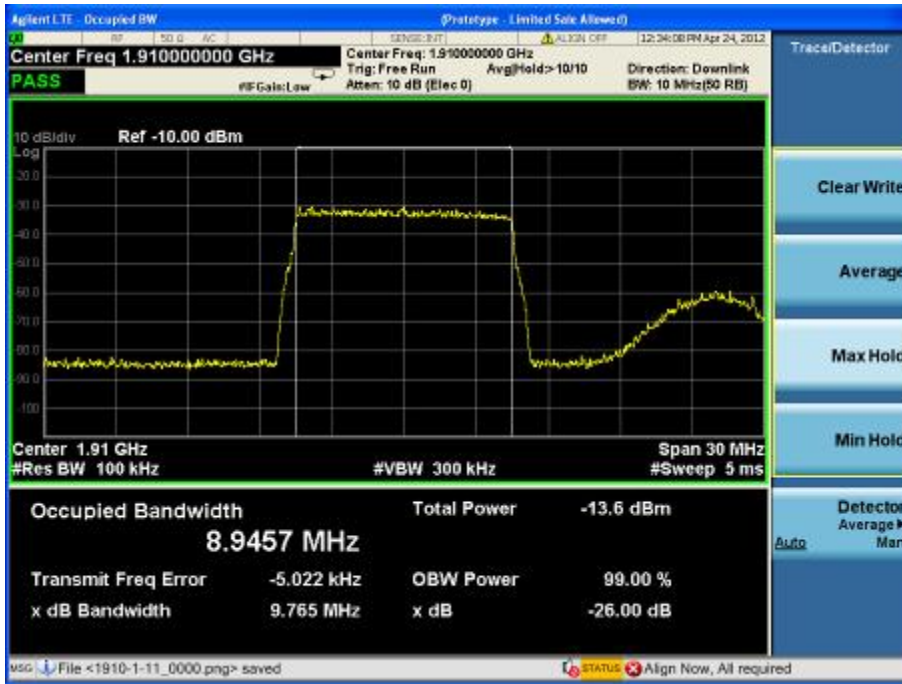


1900MHz-LTE-16QAM uplink (highest frequency )-Input

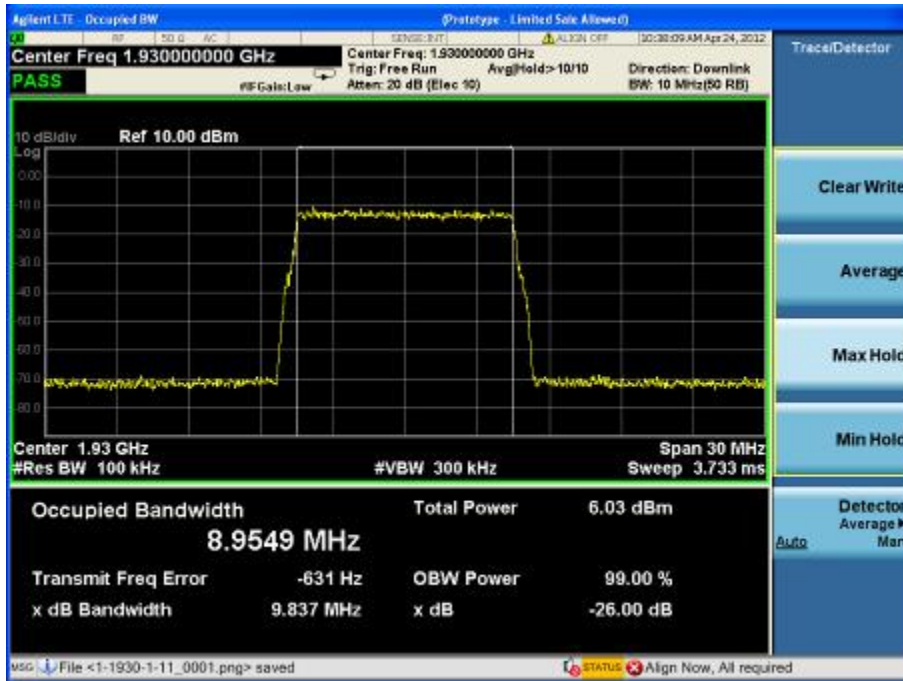




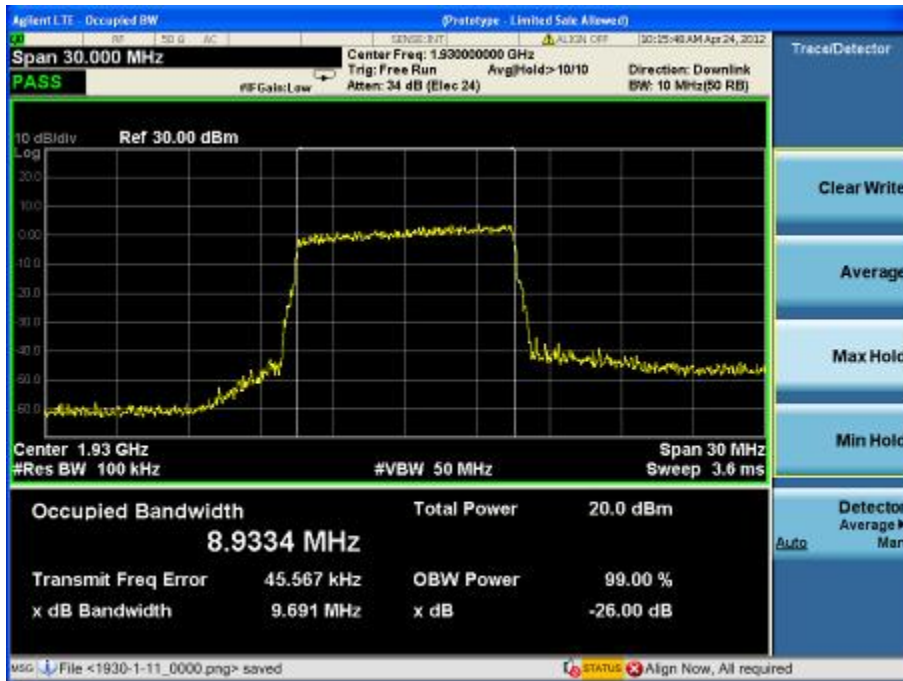
1900MHz-LTE -16QAM uplink (highest frequency)- Output



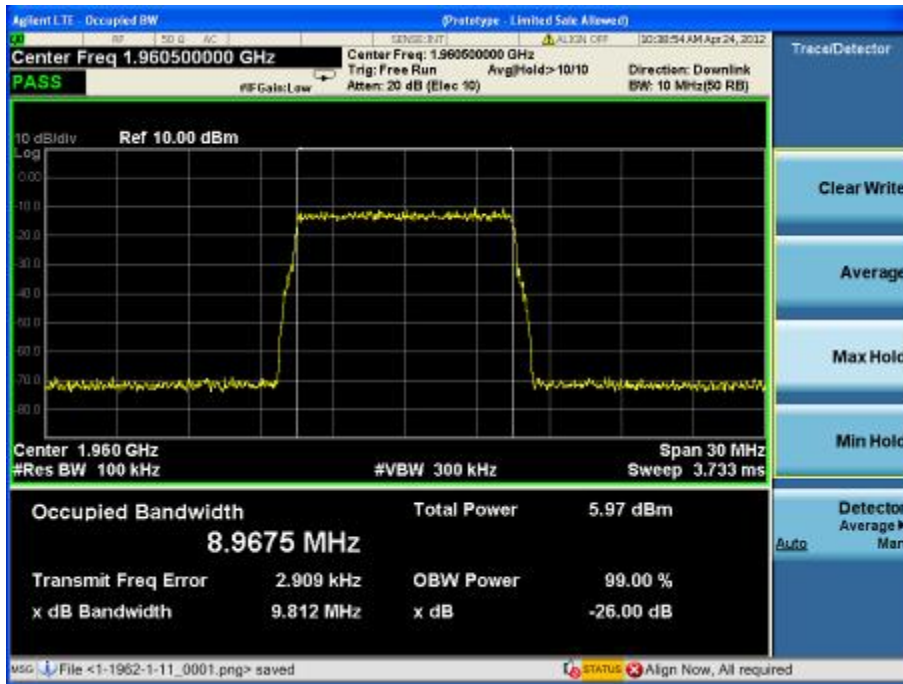
1900MHz-LTE-64QAM downlink (lowest frequency)-Input



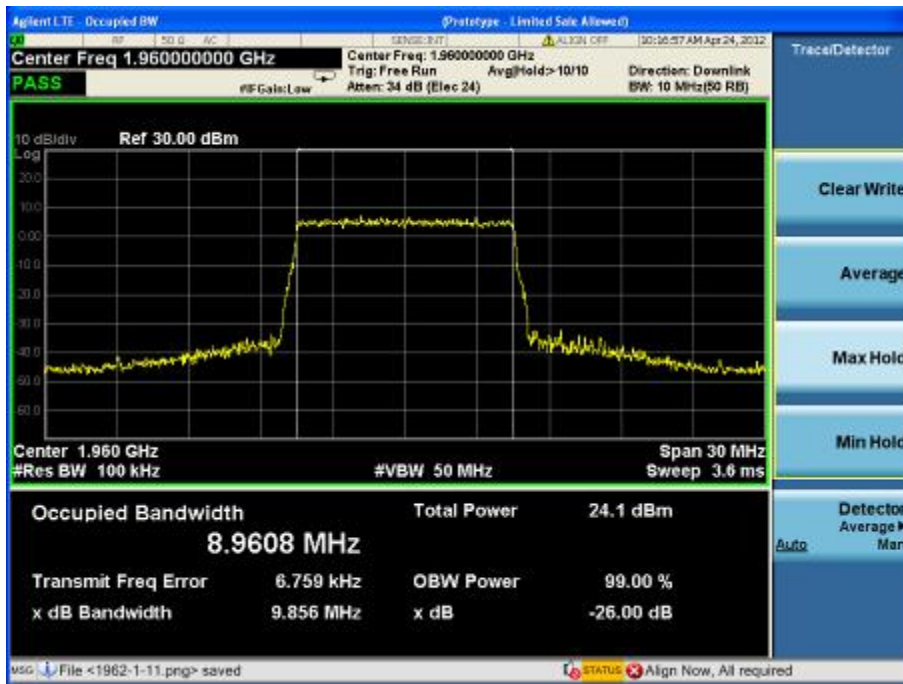
1900MHz-LTE -64QAM downlink (lowest frequency)-Output



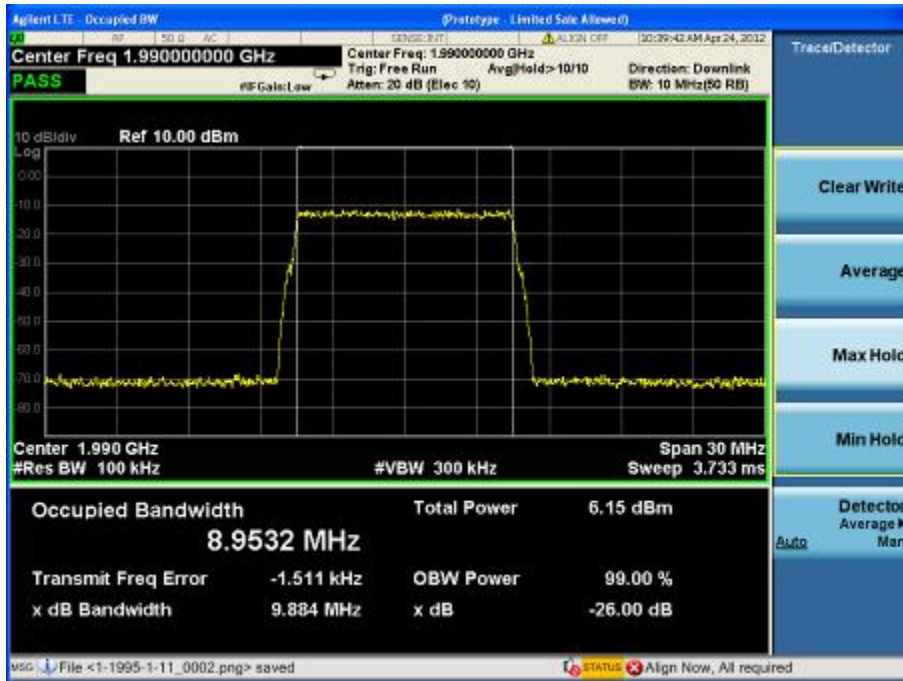
1900MHz-LTE-64QAM downlink (middle frequency)-Input



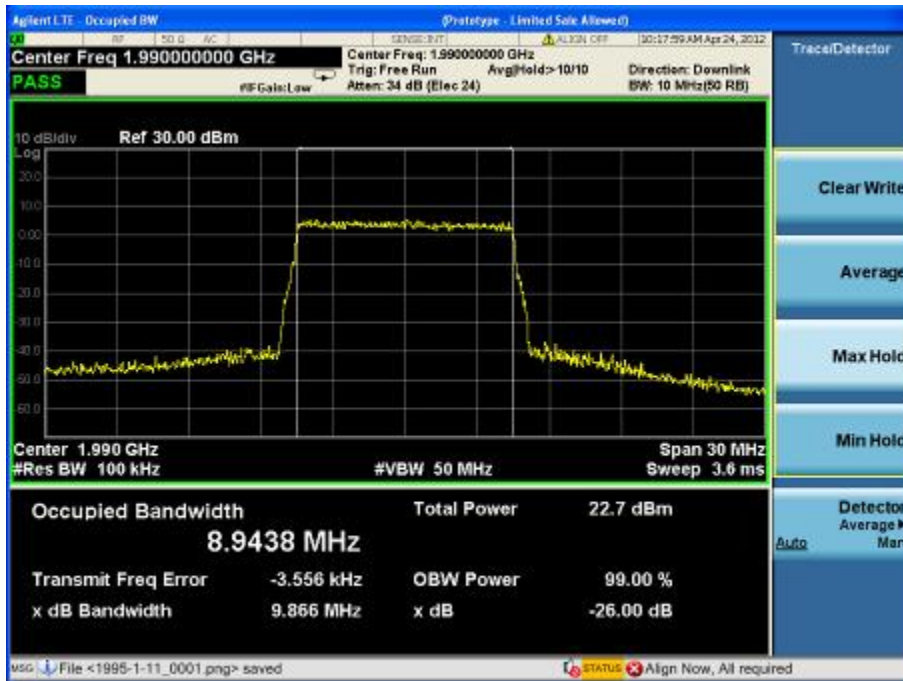
1900MHz-LTE-64QAM downlink (middle frequency)- Output



1900MHz-LTE-64QAM downlink (highest frequency )-Input

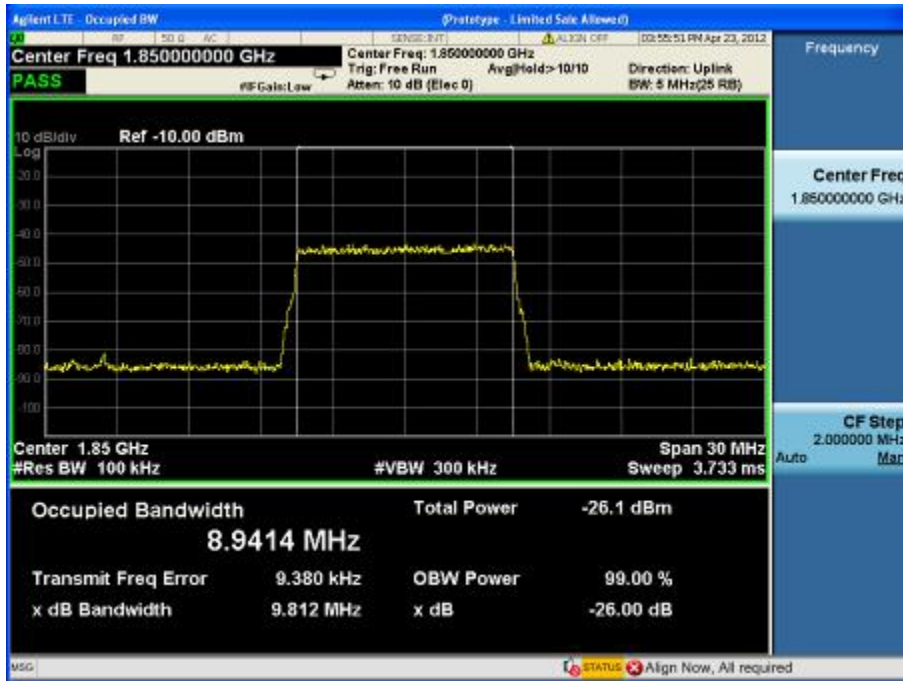


1900MHz-LTE-64QAM downlink (highest frequency)- Output

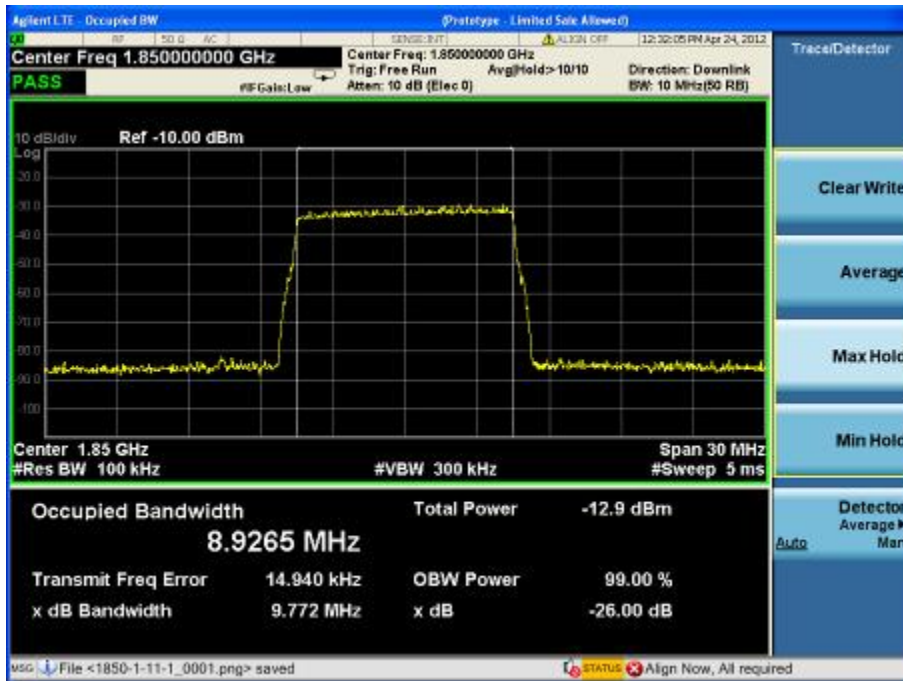




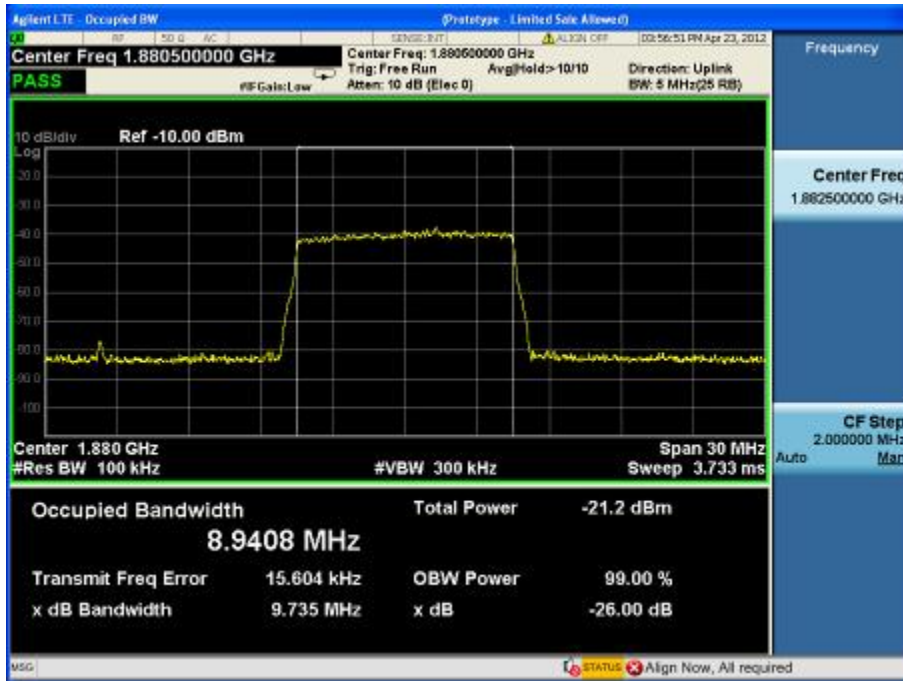
1900MHz-LTE-64QAM uplink (lowest frequency)-Input



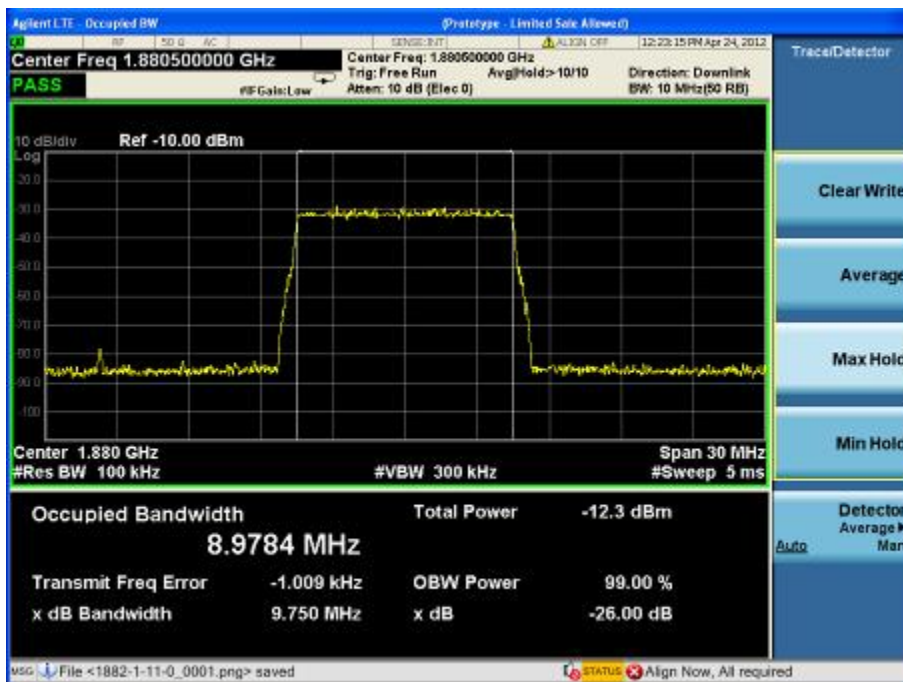
1900MHz-LTE-64QAM uplink (lowest frequency)- Output



1900MHz-LTE -64QAM uplink (middle frequency)-Input

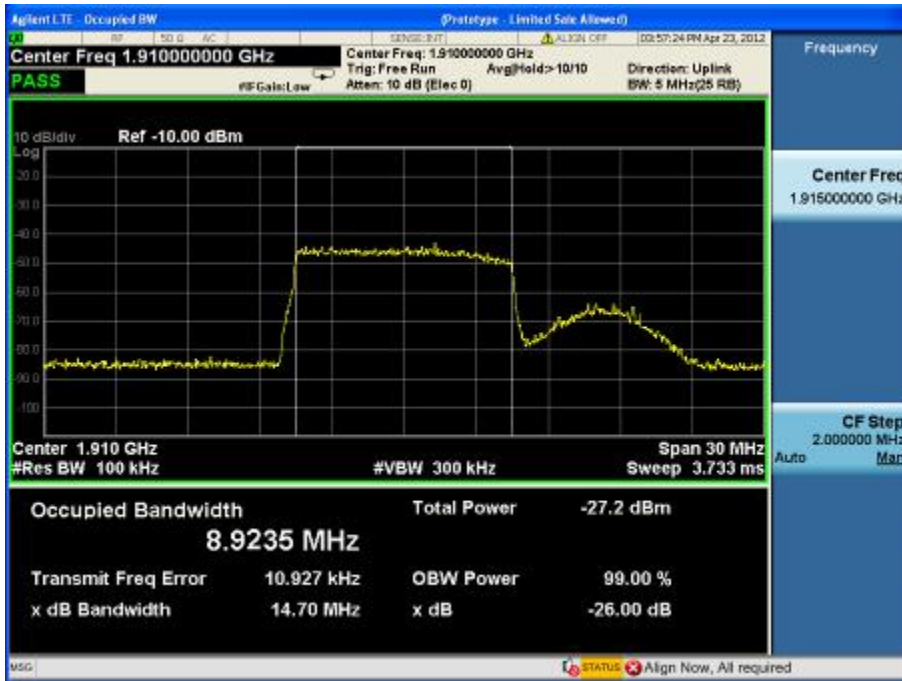


1900MHz-LTE-64QAM uplink (middle frequency)-Output

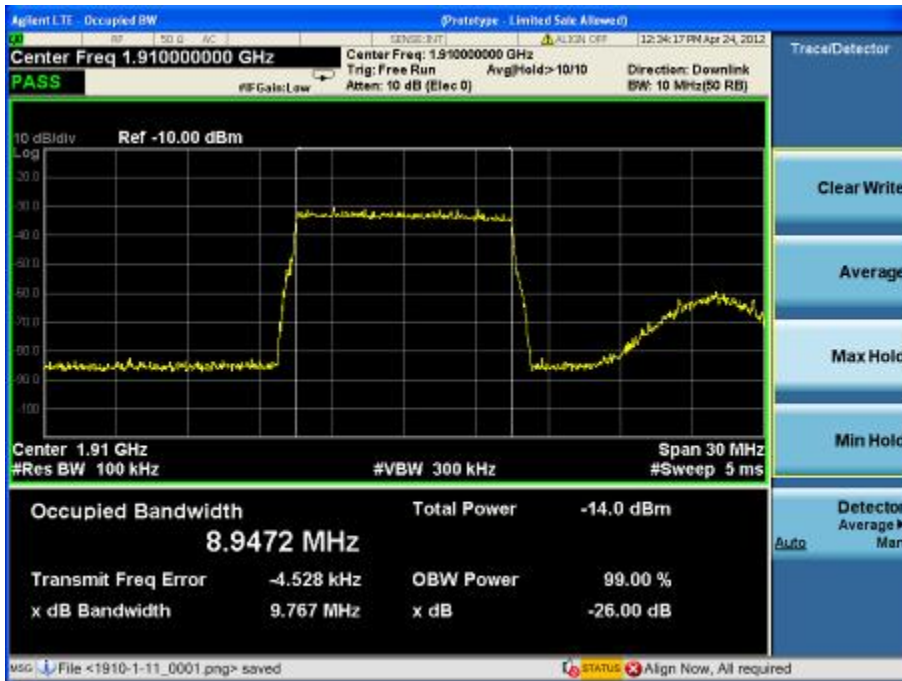




1900MHz-LTE-64QAM uplink (highest frequency )-Input



1900MHz-LTE -64QAM uplink (highest frequency)- Output



### 4.2.6 INTERMODULATION

Test Date: 05 May, 2012  
 Test Method: 2-11-04/EAB/RF

Test Requirement: FCC part 22.917(a)& FCC part 24.238(a)&FCC 27.53  
 22.917(a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.  
 24.238(a) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.

EUT Operation: Status  
 The output power of EUT be set to maximum value,the gain of EUT be set to maximum value by software through the manufacture

Conditions Normal

Application 850MHz DL and UL ports, 1900MHz DL and UL ports

Test configuration

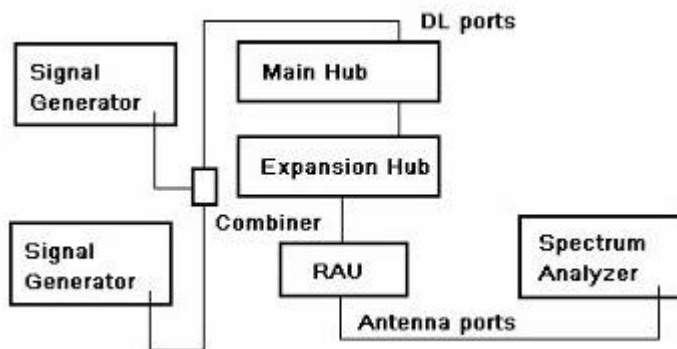


Fig.1 Down Link Intermodulation

A

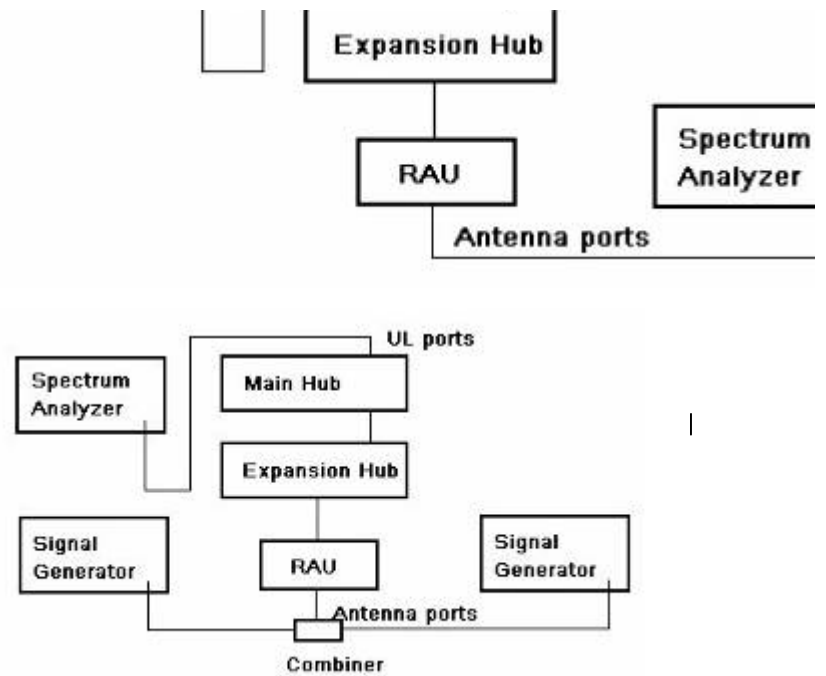


Fig.2 Up Link Intermodulation

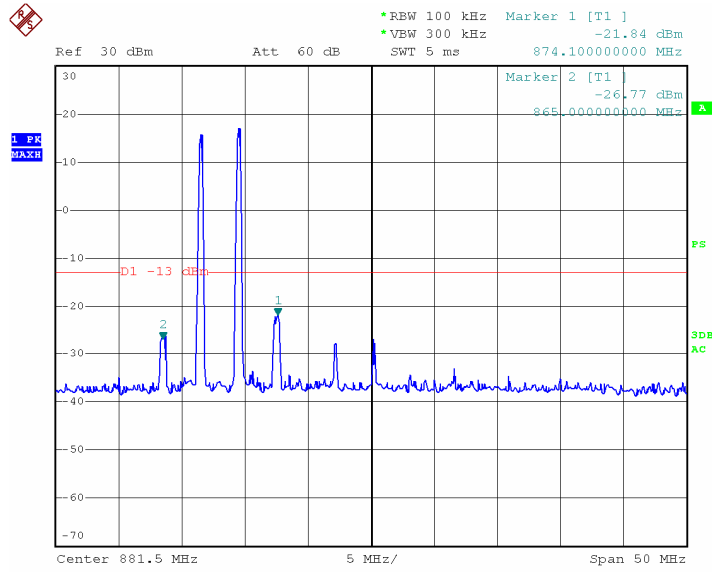
Test Procedure:

1. Connect the equipment as illustrated,
  2. Test the background noise level with all the test facilities
  3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads
  4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed
  5. Keep the EUT continuously transmitting in max power
  6. Keep two signal generator produce two signal are same in modulation type and level
  7. Measurement the 3 order intermodulated produced by the EUT (the sum of the two unwanted signal should be rated power)
  8. Correct for all losses in the RF path
  9. Read the conducted spurious emission of the EUT antenna port.
- CW signal rather than typical signal is acceptable(for FM)  
 At maximum drive level, for each modulation :one test with three tones, or two tests(high, low-band edge)with two tones  
 Limit usually is -13dBm conducted  
 Not need for signal channel systems  
 Combination of modulation types not needed

### 4.2.6.1 MEASUREMENT RECORD

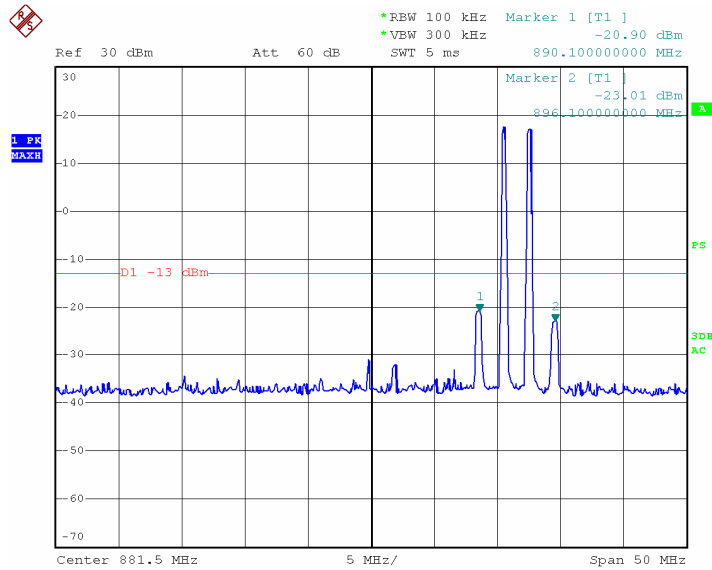
#### 850MHz

#### 850MHz-GSM down link-Lower Edge



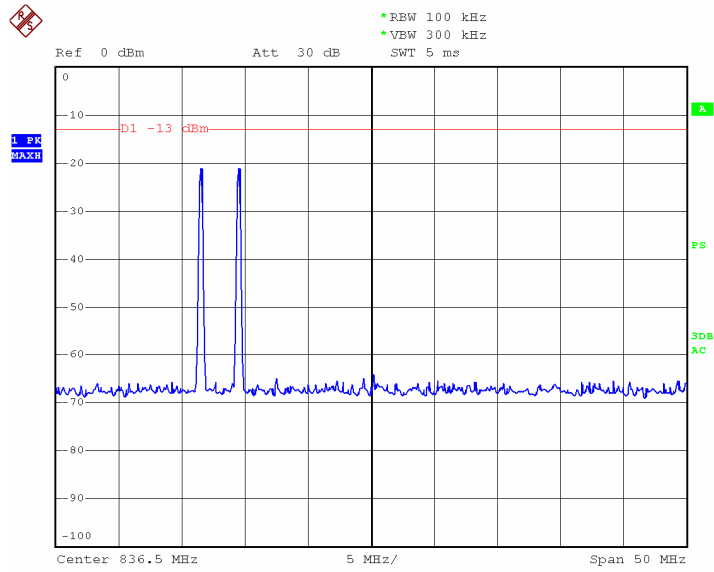
Date: 10.MAY.2012 20:41:25

#### 850MHz-GSM down link-Upper Edge



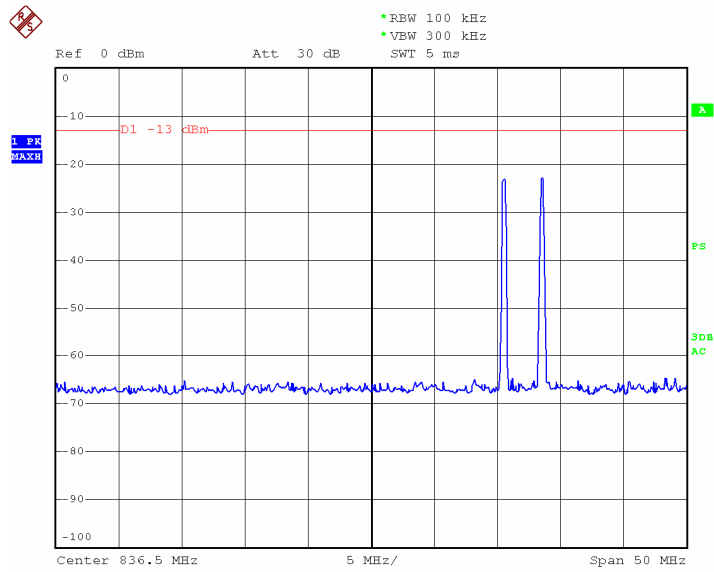
Date: 10.MAY.2012 20:40:33

### 850MHz-GSM up link-Lower Edge



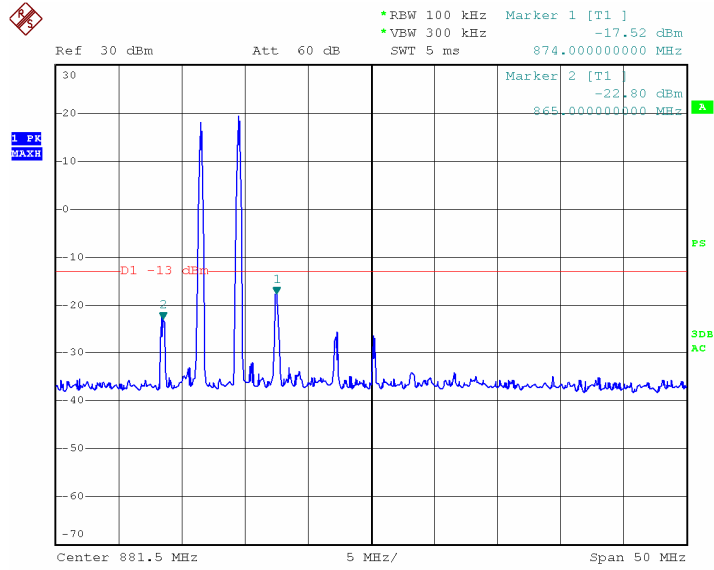
Date: 10.MAY.2012 20:56:28

### 850MHz-GSM up link-Upper Edge



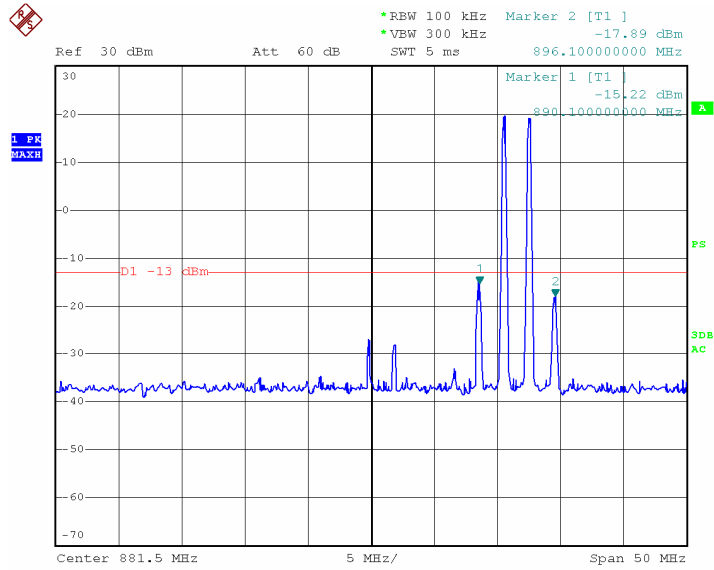
Date: 10.MAY.2012 21:29:14

### 850MHz-EDGE down link-Lower Edge



Date: 10.MAY.2012 20:38:19

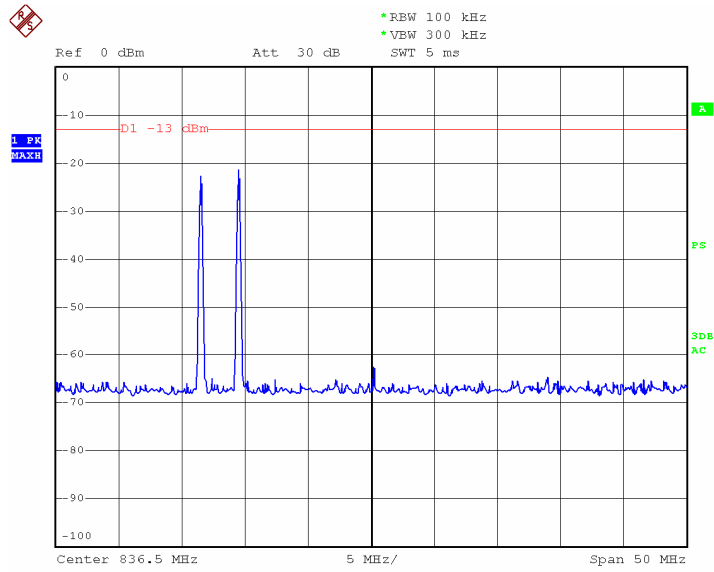
### 850MHz-EDGE down link-Upper Edge



Date: 10.MAY.2012 20:39:29

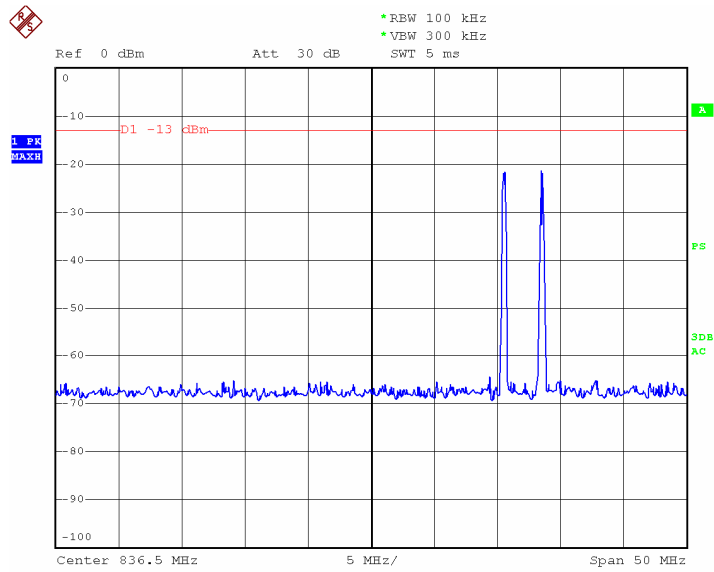


### 850MHz-EDGE up link-Lower Edge



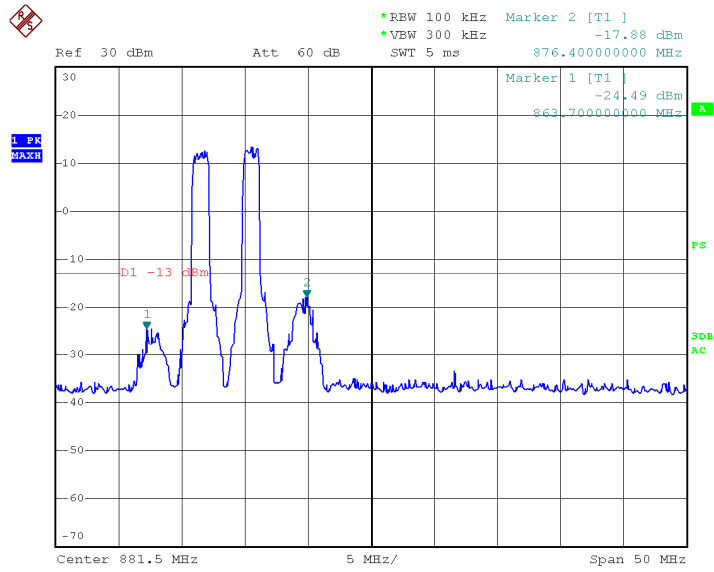
Date: 10.MAY.2012 21:00:12

### 850MHz-EDGE up link-Upper Edge



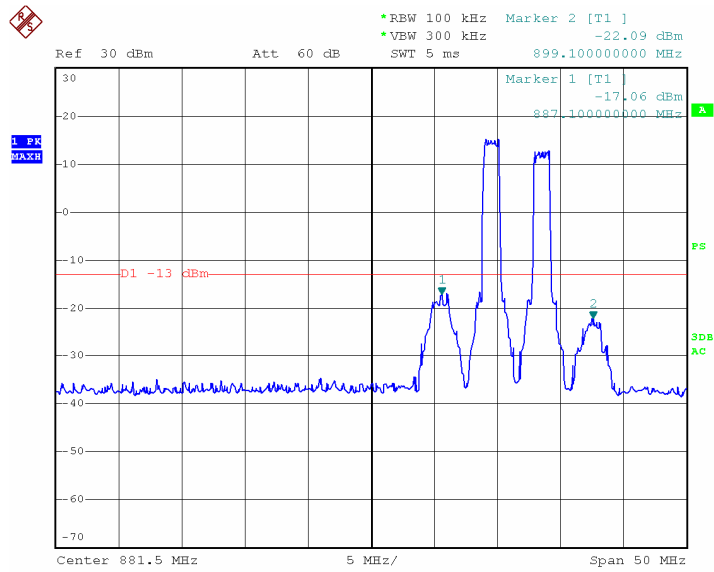
Date: 10.MAY.2012 20:59:39

### 850MHz-CDMA2000 down link-Lower Edge



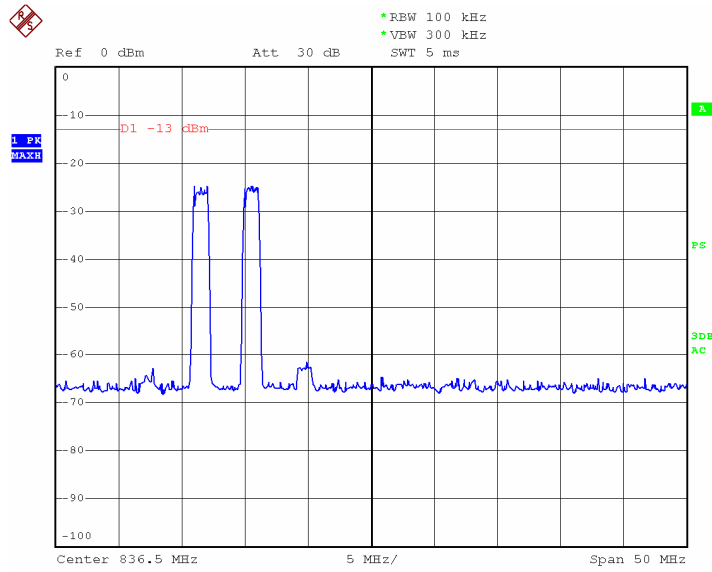
Date: 10.MAY.2012 20:08:27

### 850MHz-CDMA2000 down link-Upper Edge



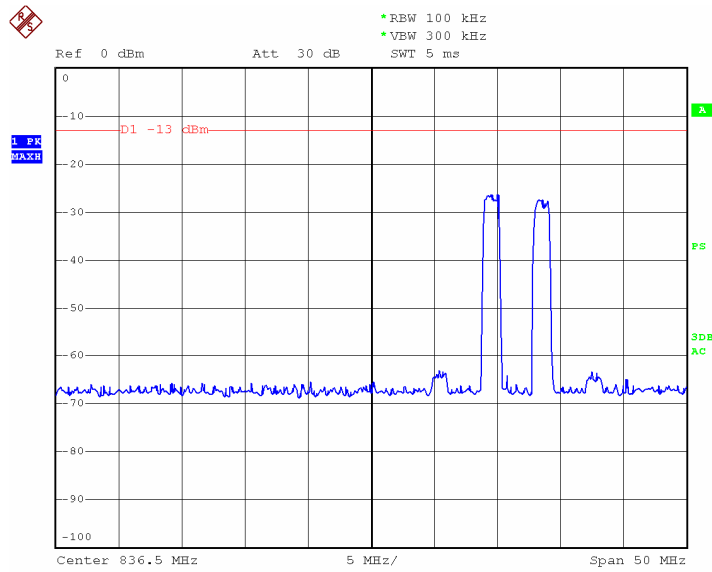
Date: 10.MAY.2012 20:09:54

### 850MHz-CDMA2000 up link-Lower Edge



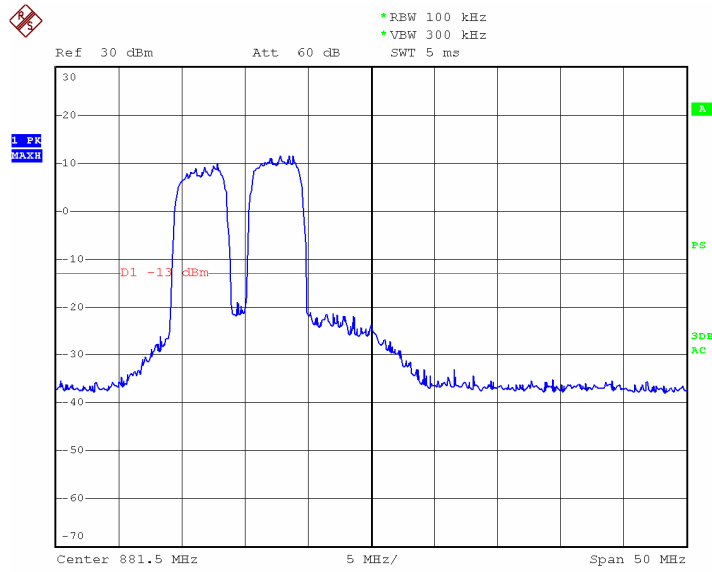
Date: 10.MAY.2012 21:02:44

### 850MHz-CDMA2000 up link-Upper Edge



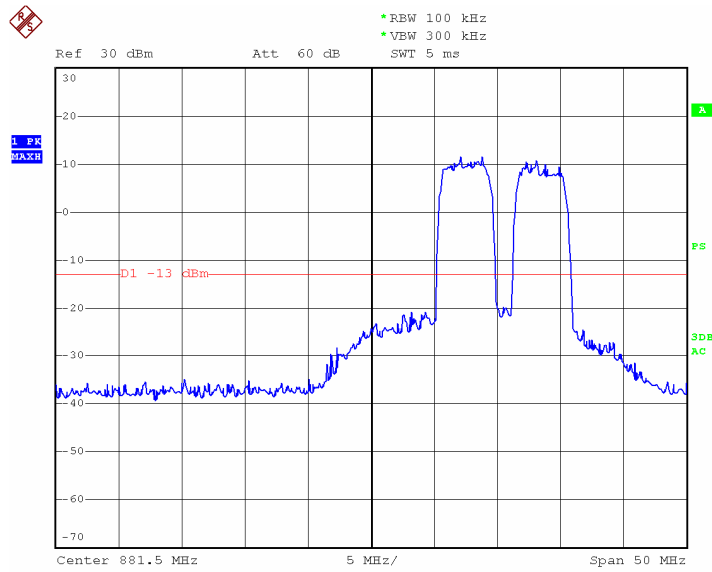
Date: 10.MAY.2012 21:03:14

### 850MHz-WCDMA down link-Lower Edge



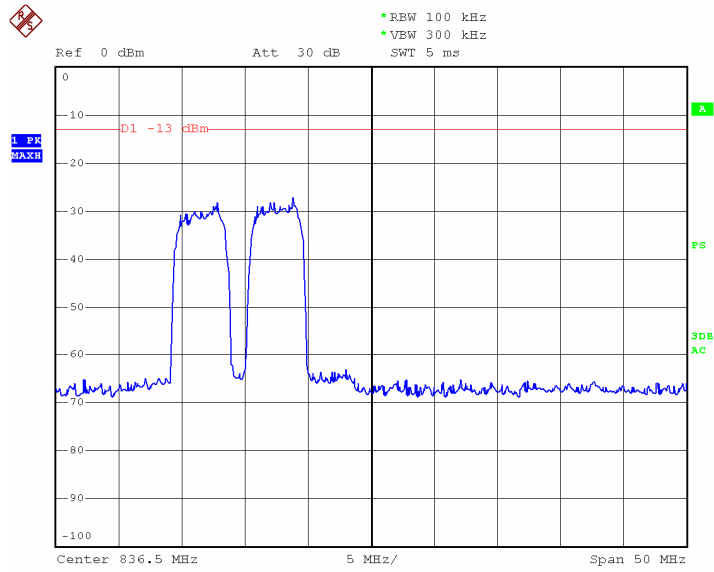
Date: 10.MAY.2012 20:15:58

### 850MHz-WCDMA down link-Upper Edge



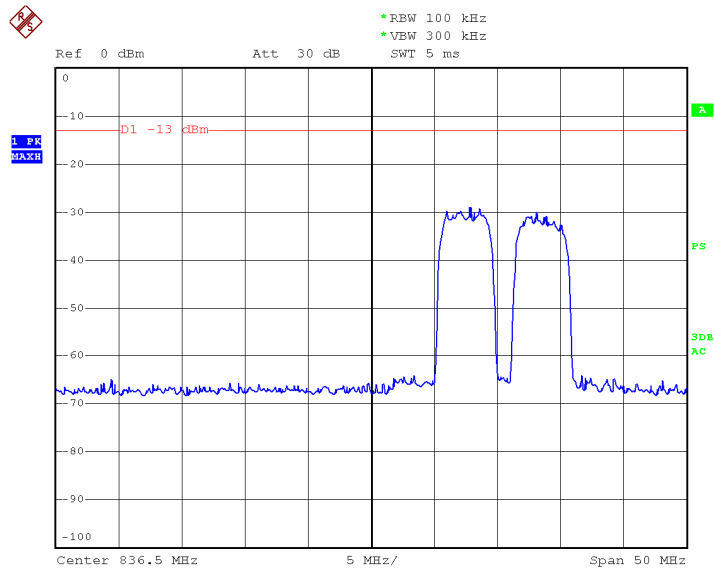
Date: 10.MAY.2012 20:16:42

### 850MHz-WCDMA up link-Lower Edge



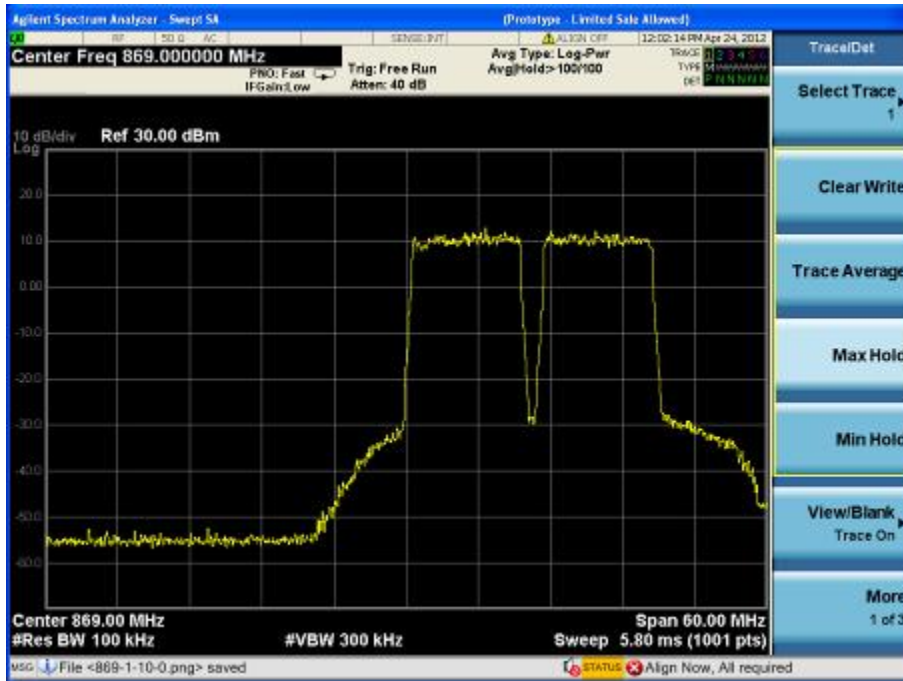
Date: 10.MAY.2012 21:05:43

### 850MHz-WCDMA up link-Upper Edge

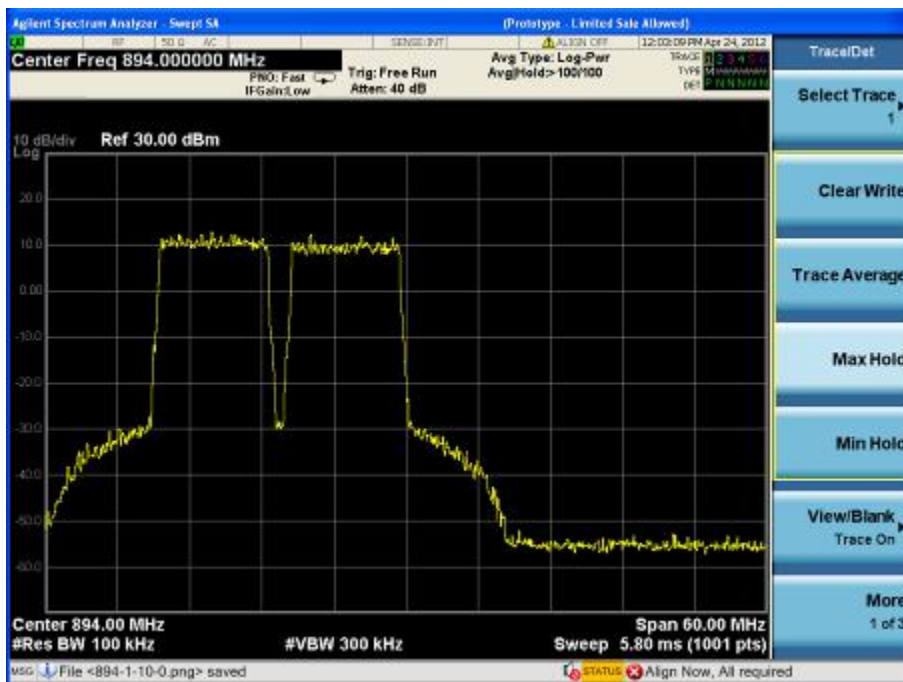


Date: 10.MAY.2012 21:05:10

850MHz-LTE-QPSK down link-Lower Edge

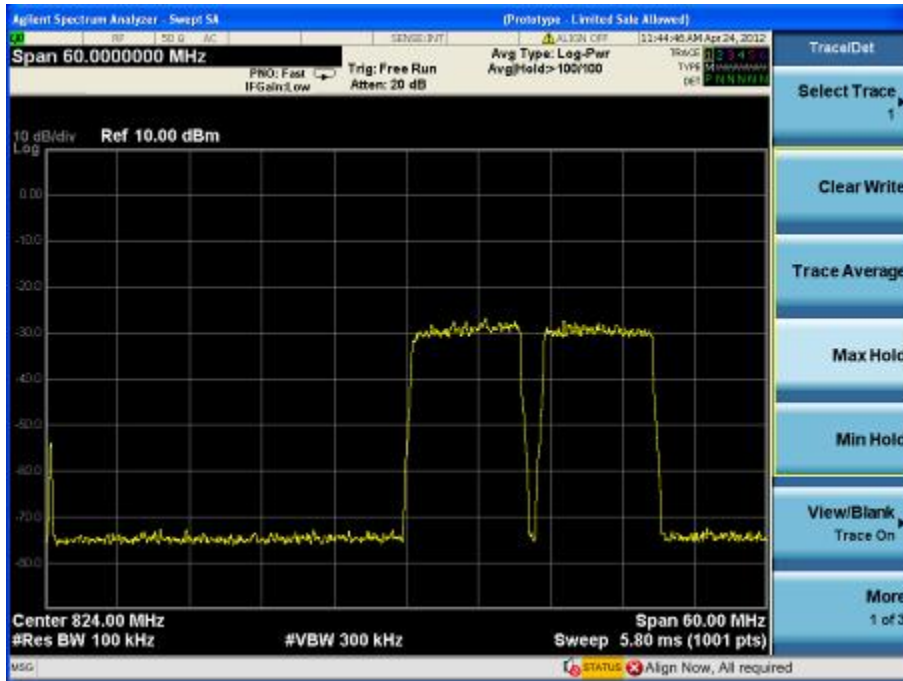


850MHz-LTE-QPSK down link-Upper Edge

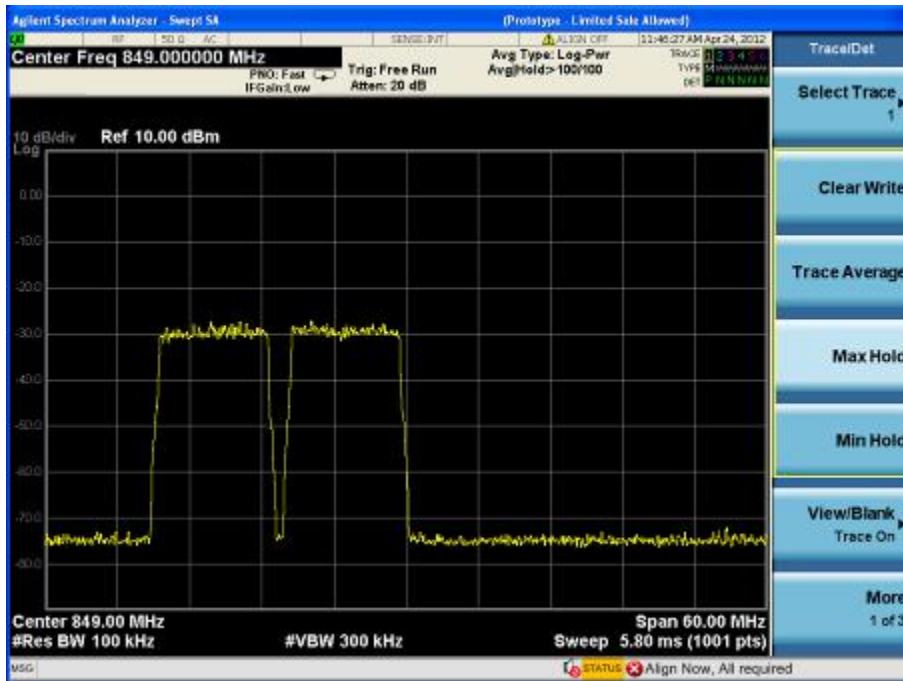




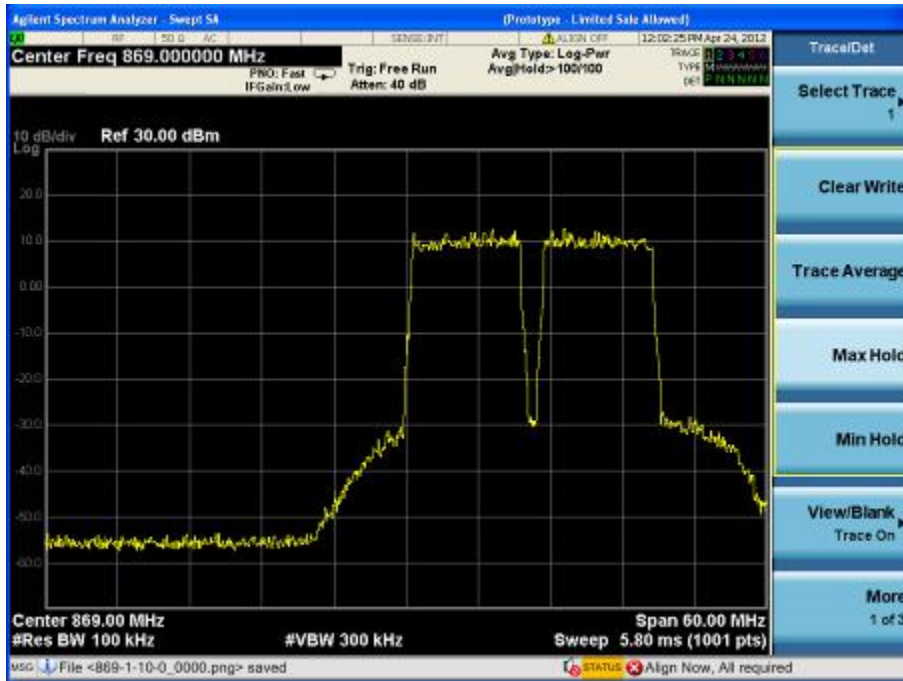
850MHz-LTE-QPSK up link-Lower Edge



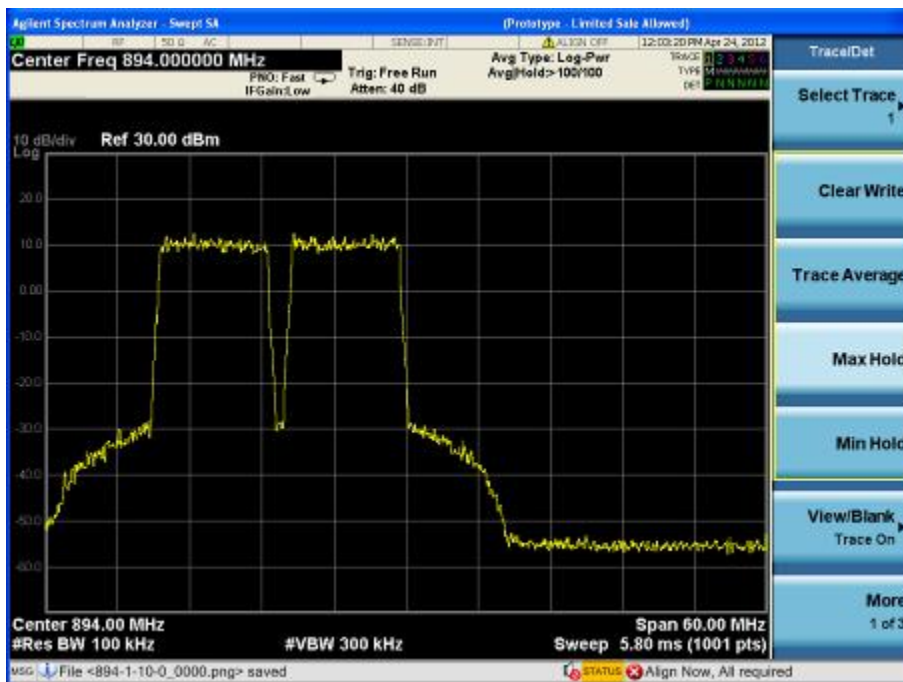
850MHz-LTE-QPSK up link-Upper Edge



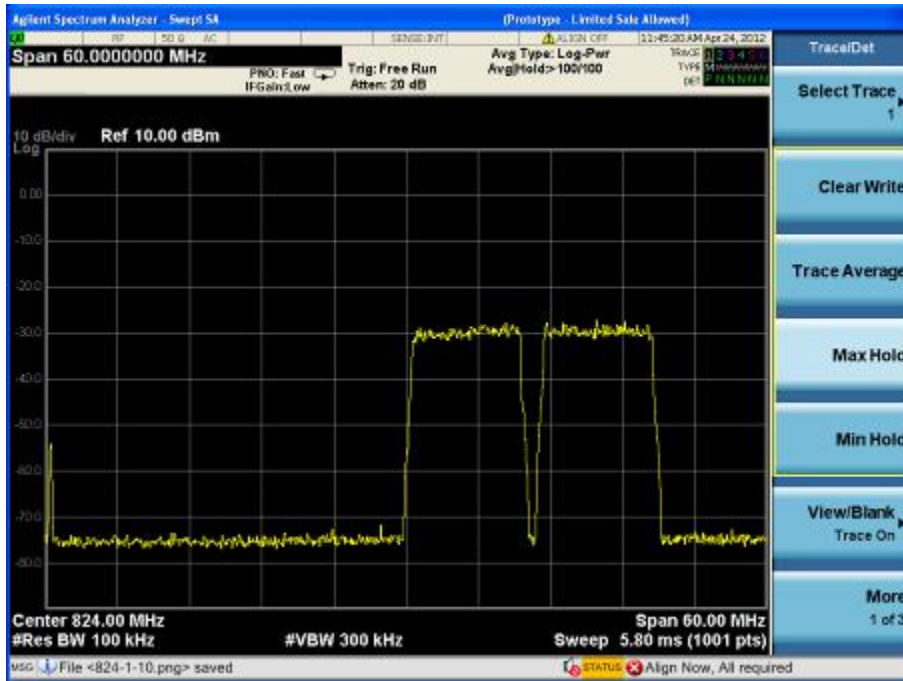
850MHz-LTE-16QAM down link-Lower Edge



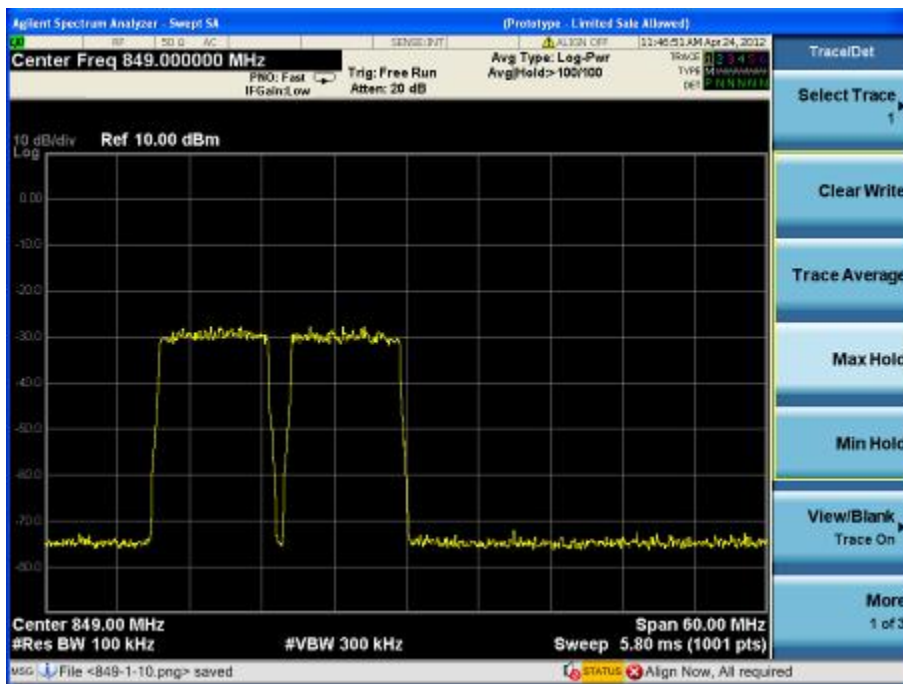
850MHz-LTE-16QAM down link-Upper Edge



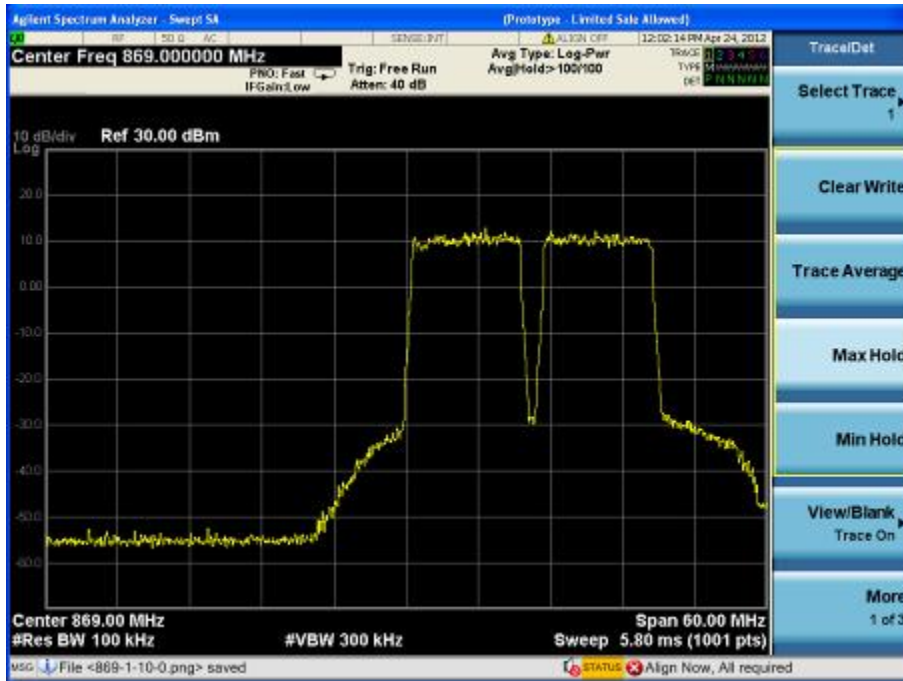
850MHz-LTE-16QAM up link-Lower Edge



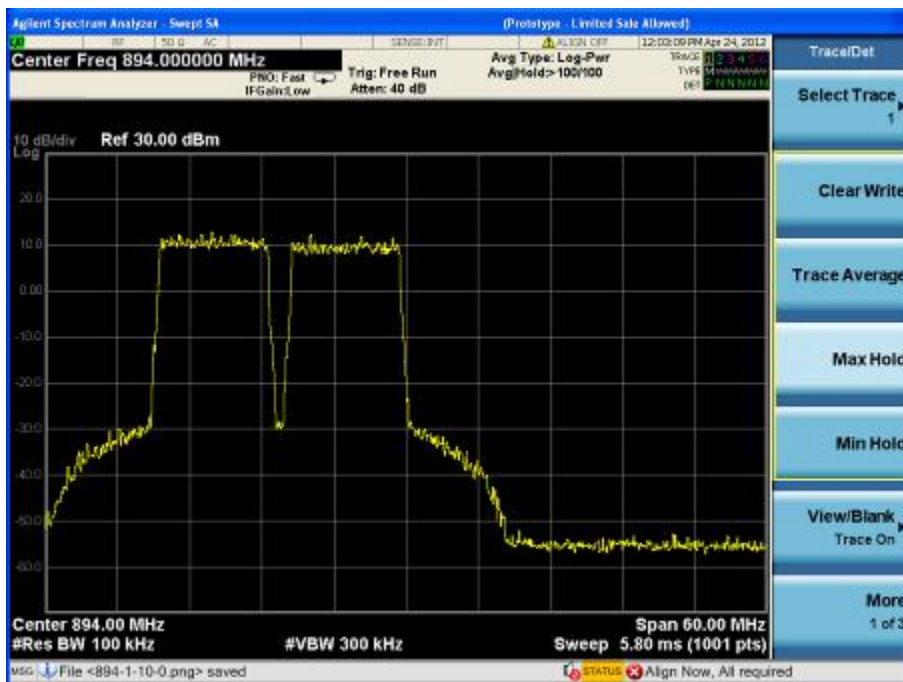
850MHz-LTE-16QAM up link-Upper Edge



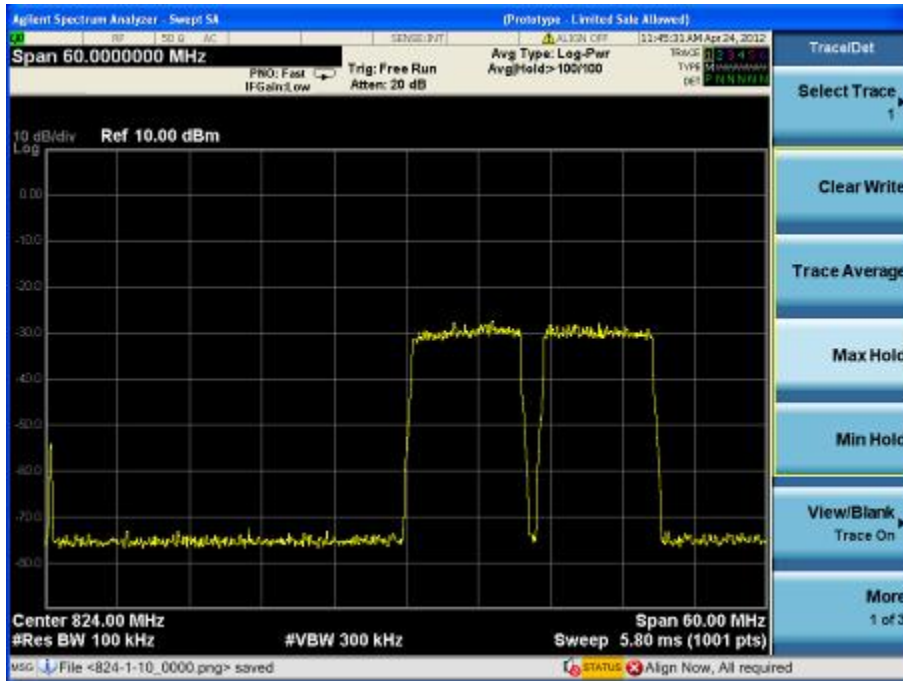
850MHz-LTE-64QAM down link-Lower Edge



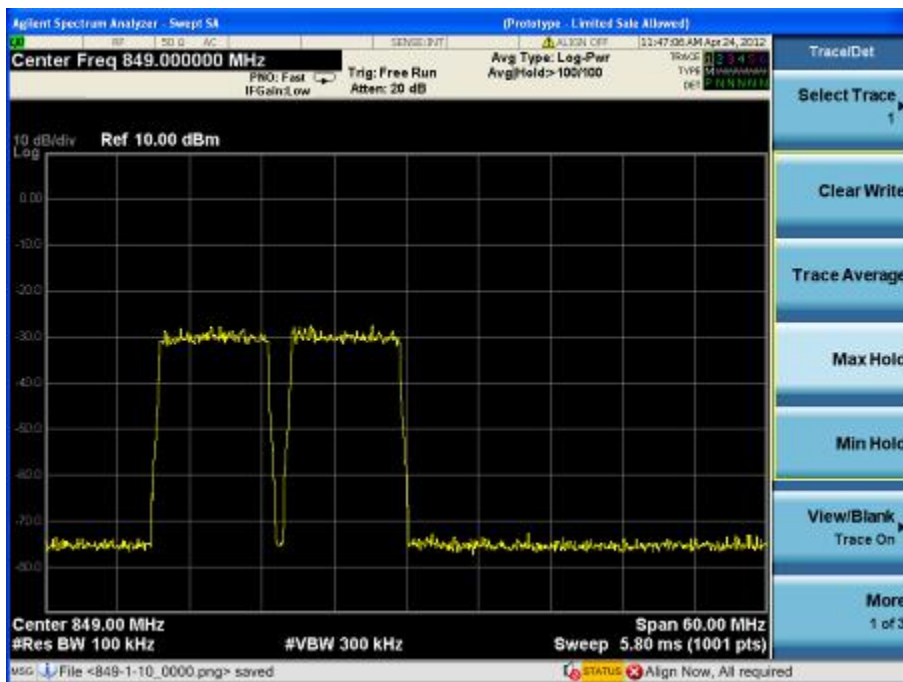
850MHz-LTE-64QAM down link-Upper Edge



850MHz-LTE-64QAM up link-Lower Edge

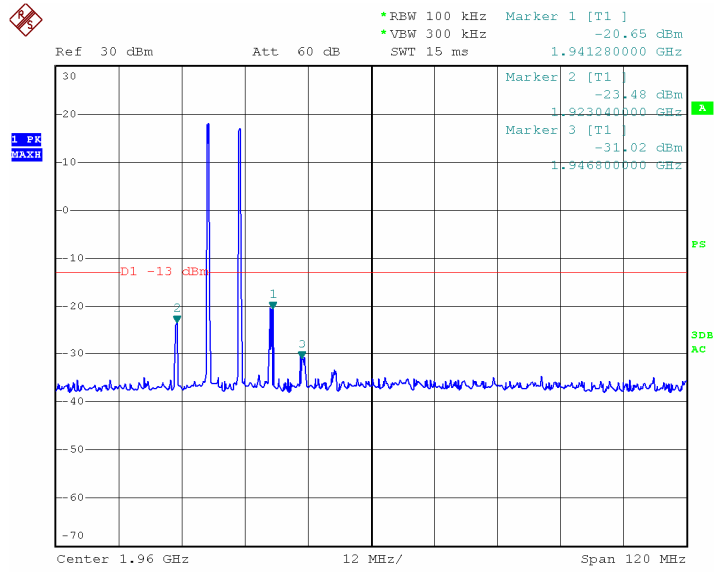


850MHz-LTE-64QAM up link-Upper Edge



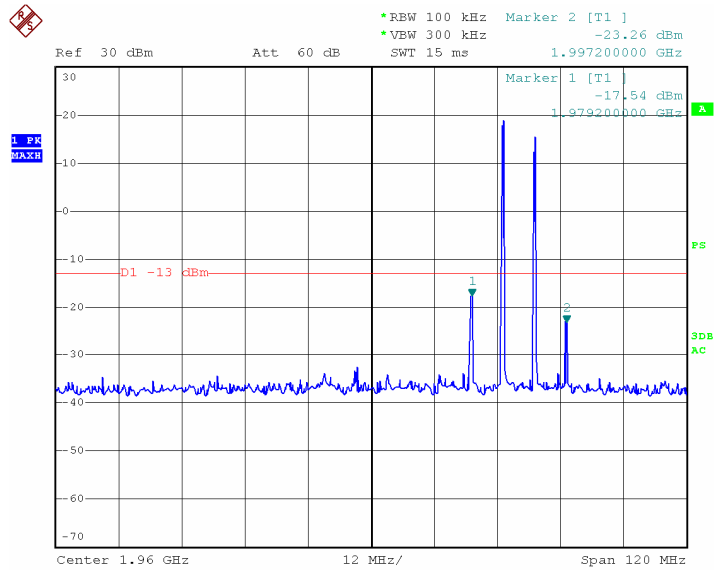
### 1900MHz

#### 1900MHz-GSM down link-Lower Edge



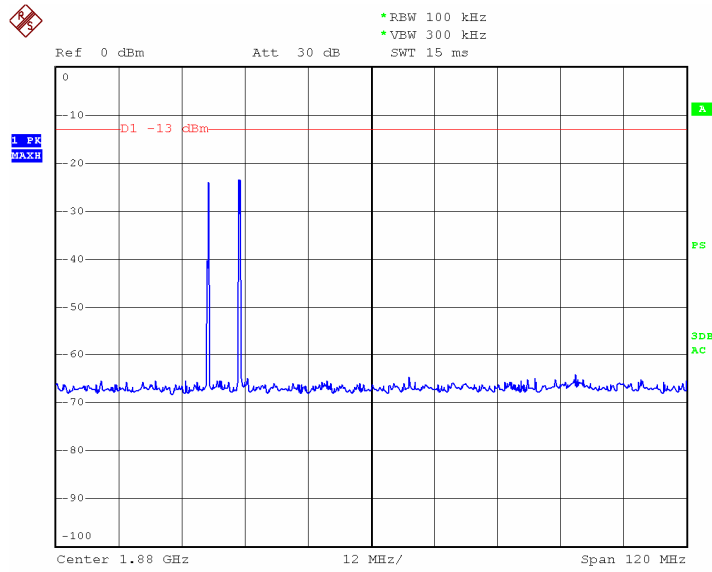
Date: 10.MAY.2012 20:26:06

#### 1900MHz-GSM down link-Upper Edge



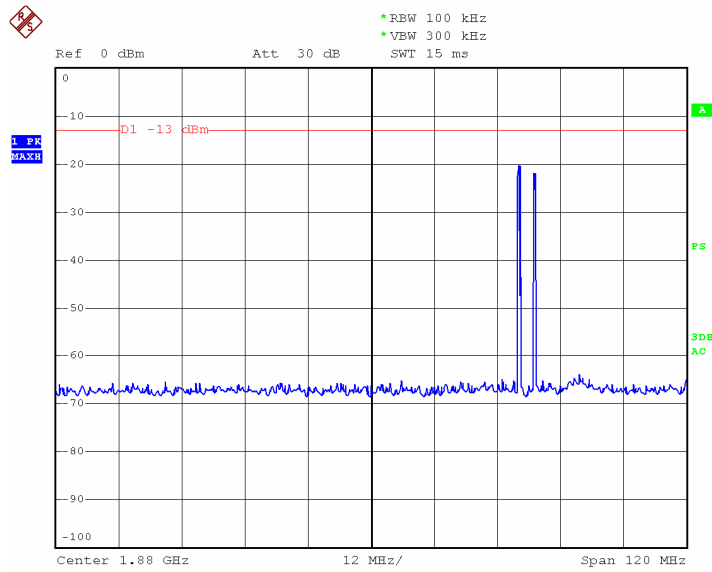
Date: 10.MAY.2012 20:25:10

### 1900MHz-GSM up link-Lower Edge



Date: 10.MAY.2012 21:17:18

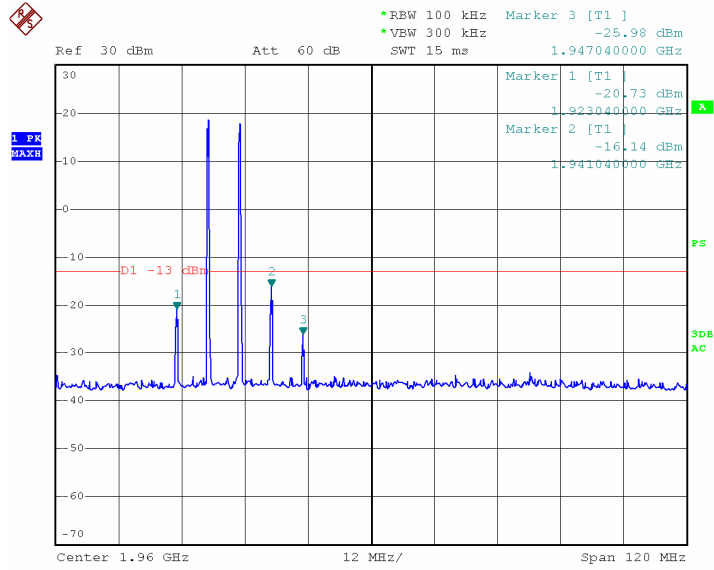
### 1900MHz-GSM up link-Upper Edge



Date: 10.MAY.2012 21:18:21

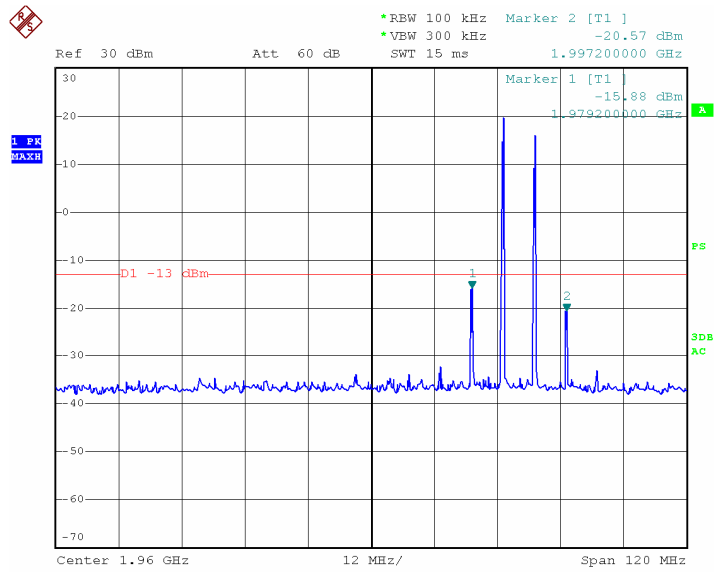


### 1900MHz-EDGE down link-Lower Edge



Date: 10.MAY.2012 20:22:55

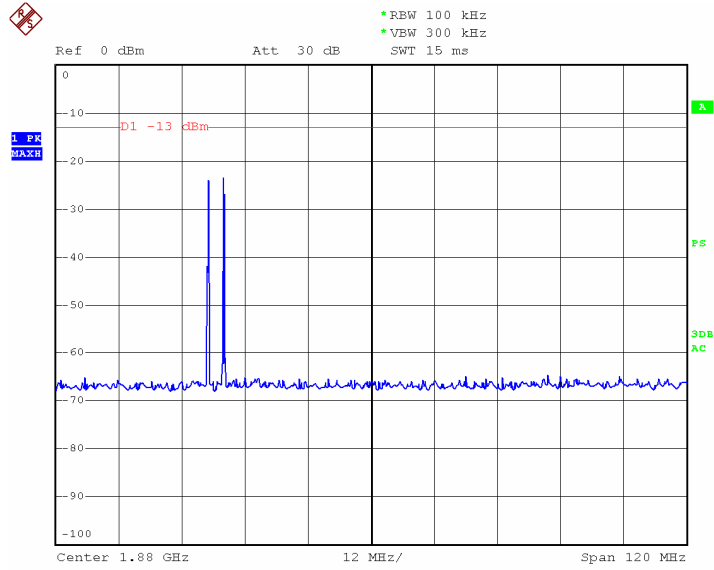
### 1900MHz-EDGE down link-Upper Edge



Date: 10.MAY.2012 20:23:50

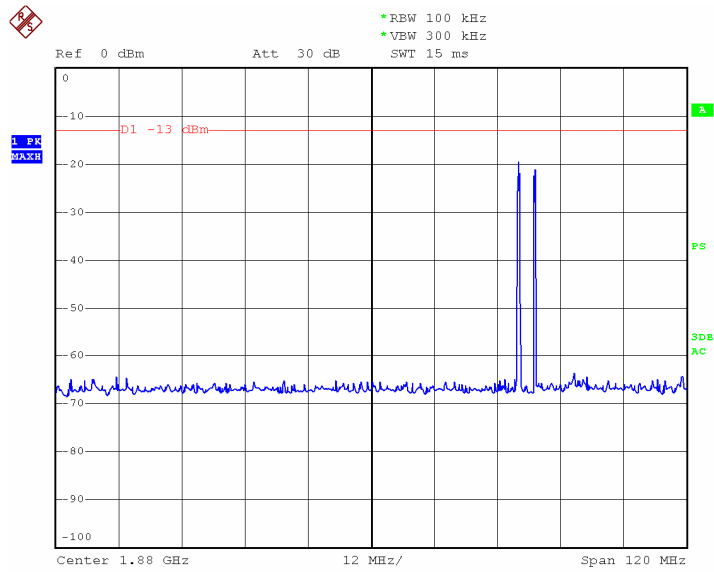


### 1900MHz-EDGE up link-Lower Edge



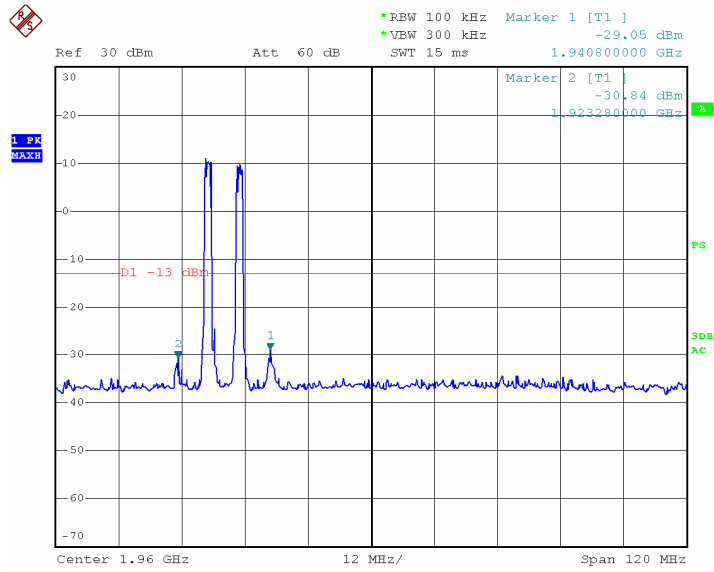
Date: 10.MAY.2012 21:20:11

### 1900MHz-EDGE up link-Upper Edge



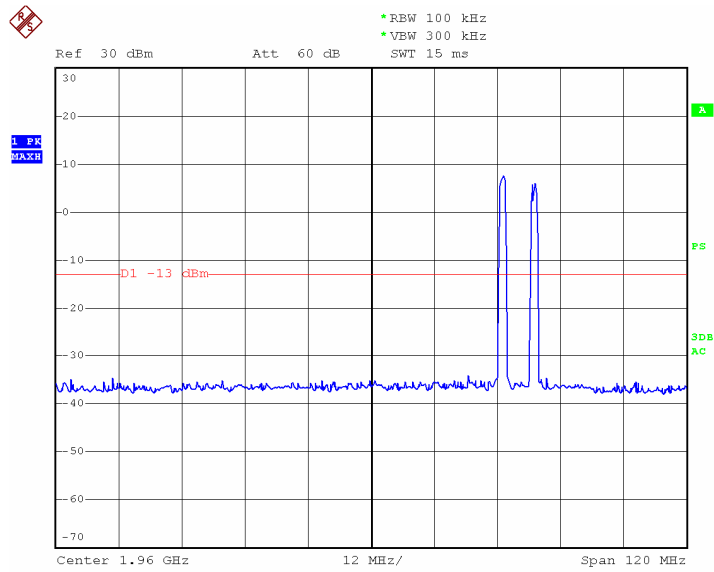
Date: 10.MAY.2012 21:19:02

### 1900MHz-CDMA2000 down link-Lower Edge



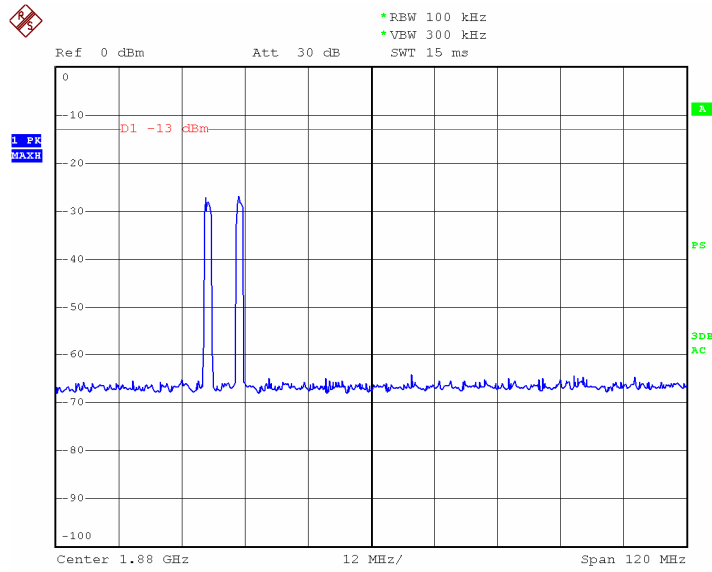
Date: 10.MAY.2012 20:28:20

### 1900MHz-CDMA2000 down link-Upper Edge



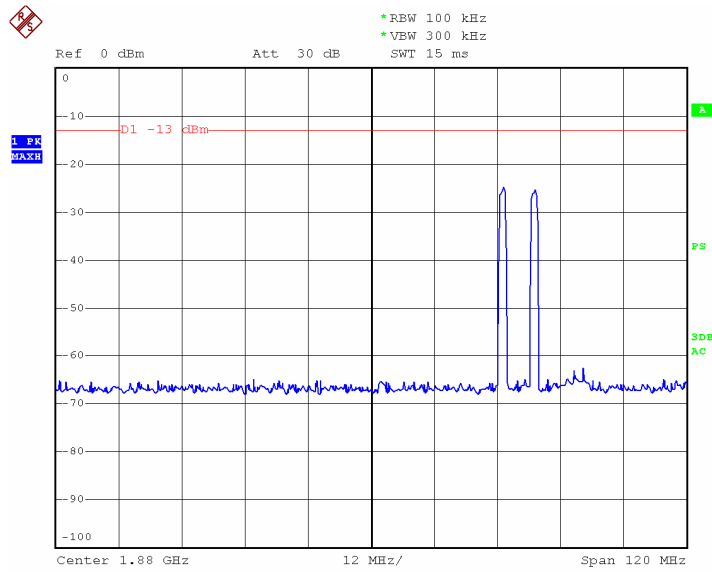
Date: 10.MAY.2012 20:29:59

### 1900MHz-CDMA2000 up link-Lower Edge



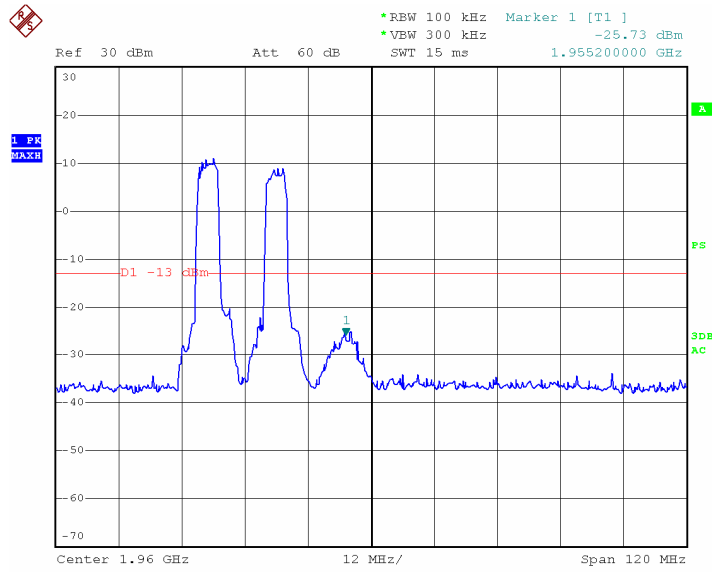
Date: 10.MAY.2012 21:14:36

### 1900MHz-CDMA2000 up link-Upper Edge



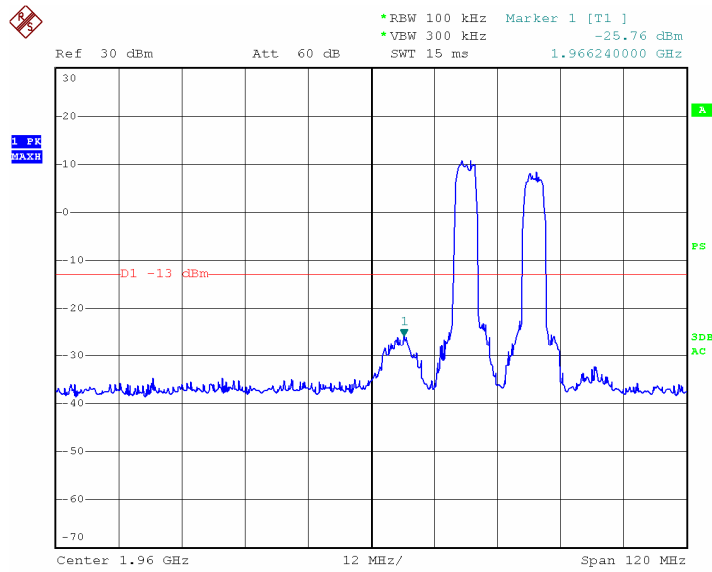
Date: 10.MAY.2012 21:13:47

### 1900MHz-WCDMA down link-Lower Edge



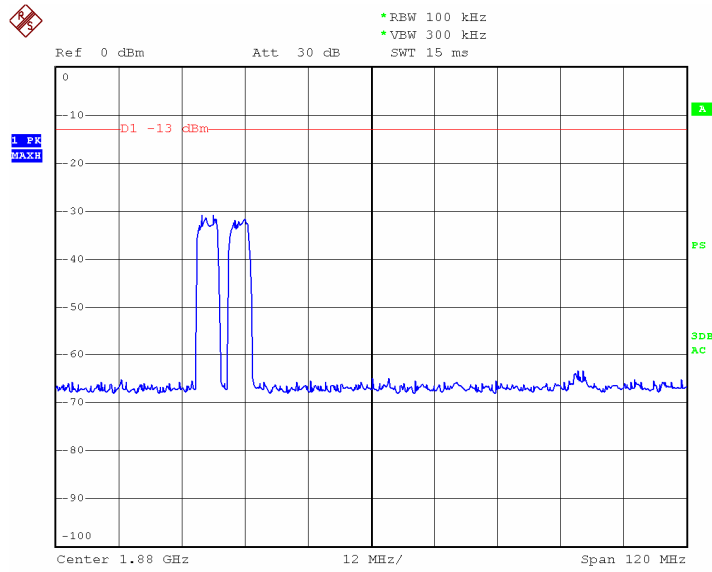
Date: 10.MAY.2012 20:32:15

### 1900MHz-WCDMA down link-Upper Edge



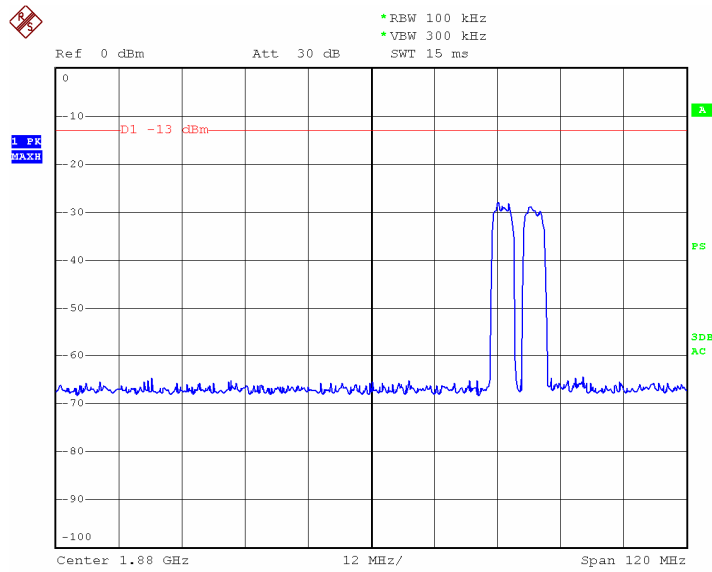
Date: 10.MAY.2012 20:33:04

### 1900MHz-WCDMA up link-Lower Edge



Date: 10.MAY.2012 21:10:50

### 1900MHz-WCDMA up link-Upper Edge



Date: 10.MAY.2012 21:12:20

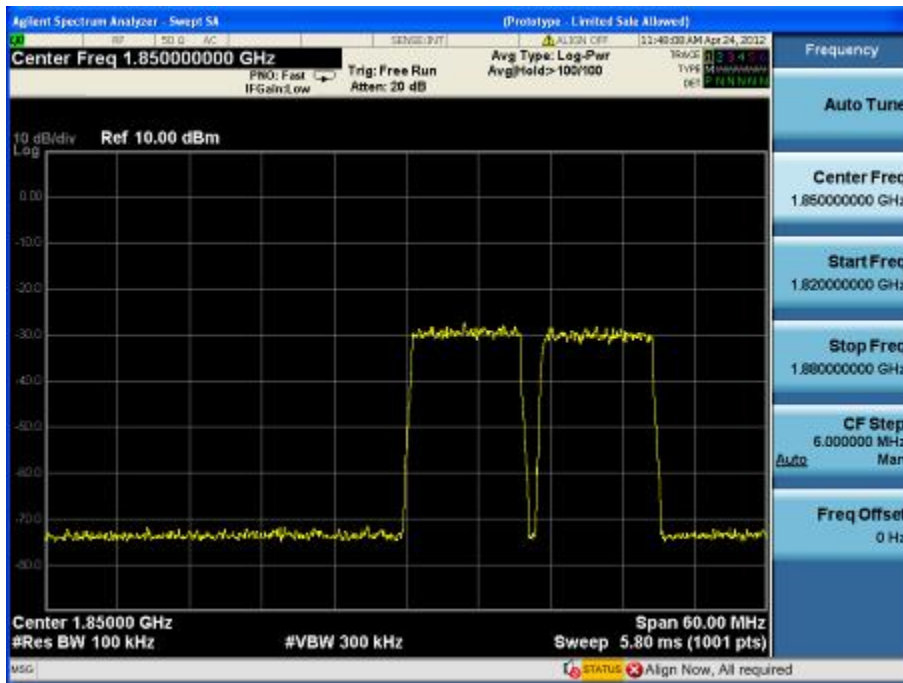
190MHz-LTE-QPSK down link-Lower Edge



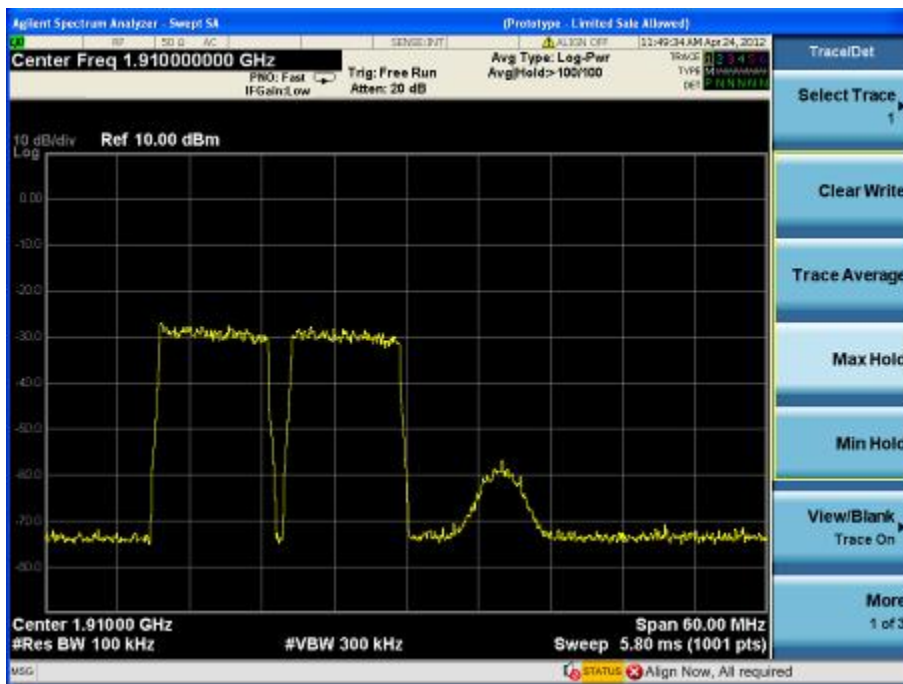
1900MHz-LTE-QPSK down link-Upper Edge



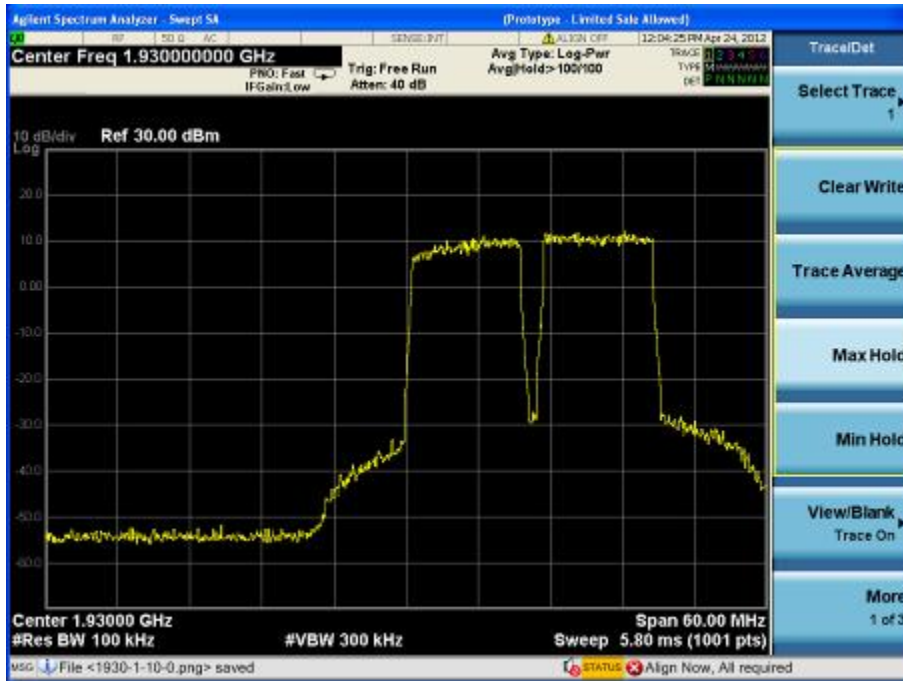
1900MHz-LTE-QPSK up link-Lower Edge



1900MHz-LTE-QPSK up link-Upper Edge



1900MHz-LTE-16QAM down link-Lower Edge

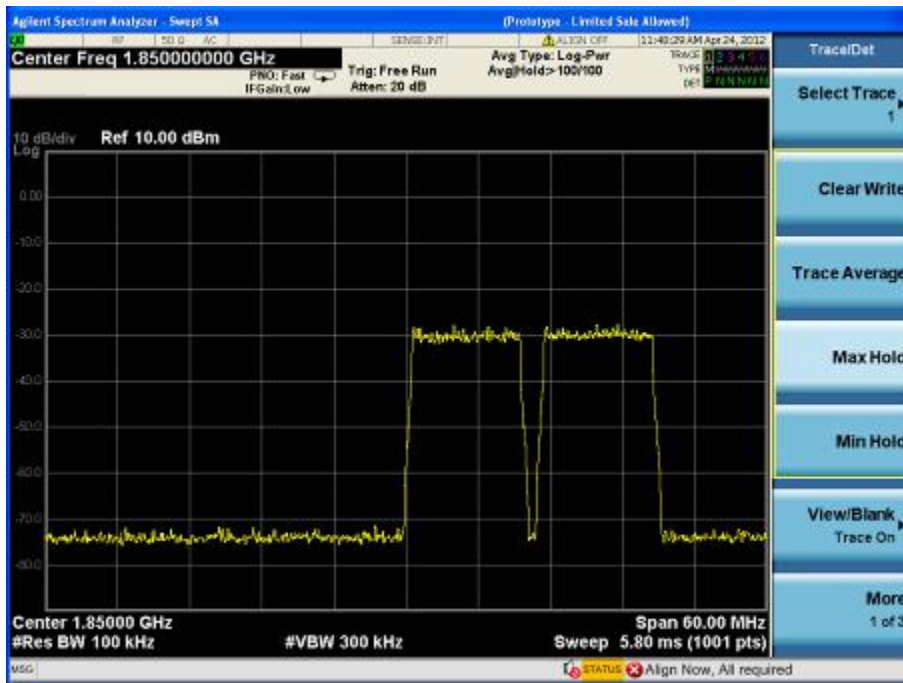


1900MHz-LTE-16QAM down link-Upper Edge

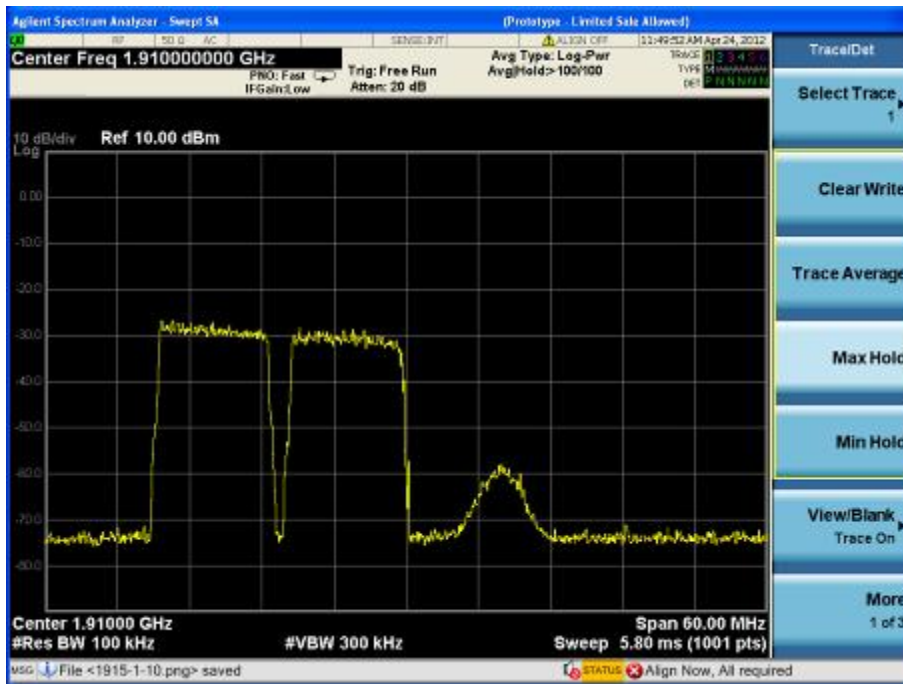




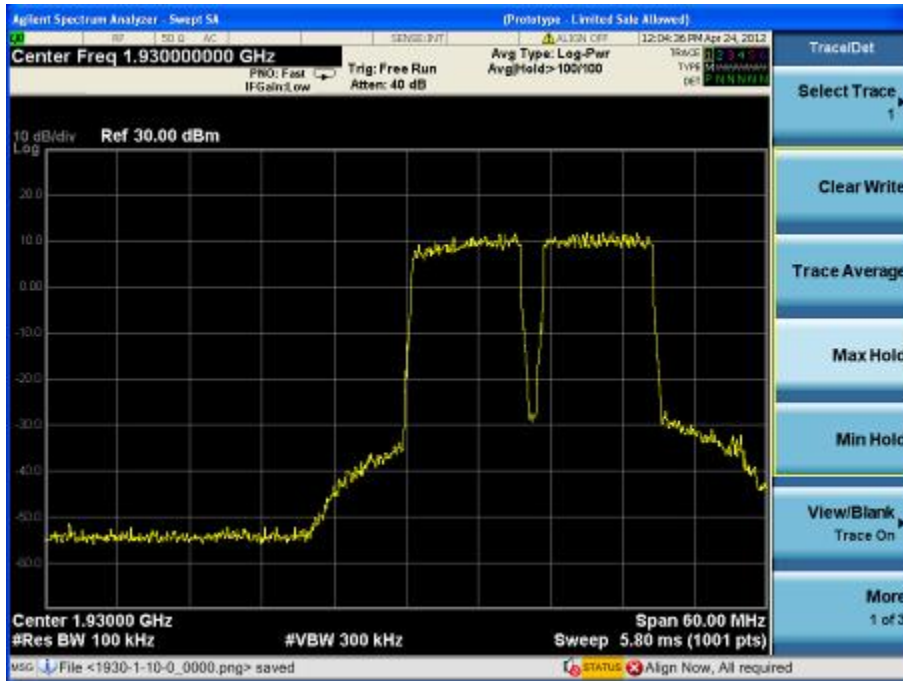
1900MHz-LTE-16QAM up link-Lower Edge



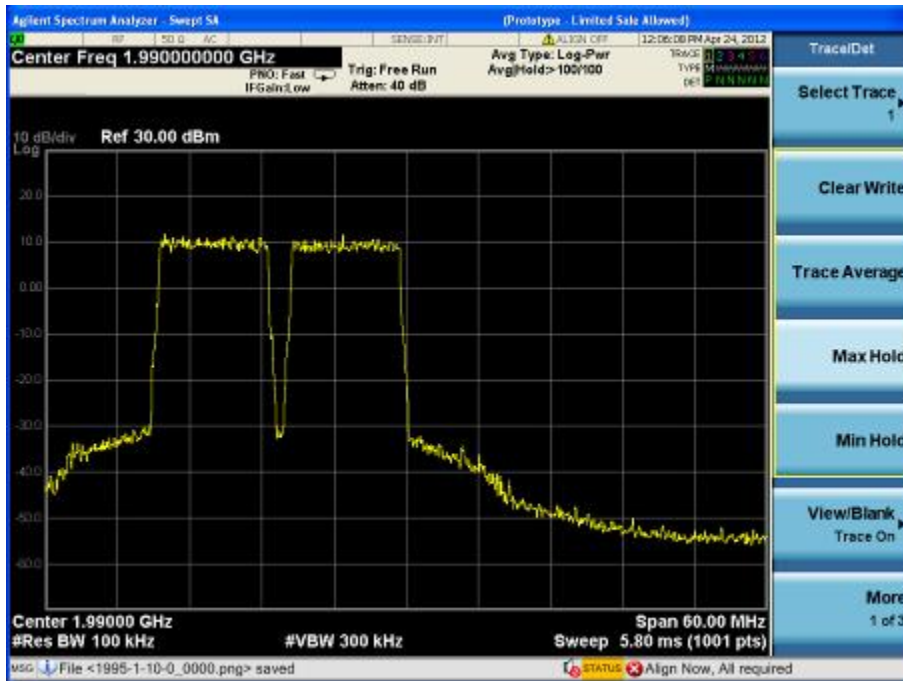
1900MHz-LTE-16QAM up link-Upper Edge



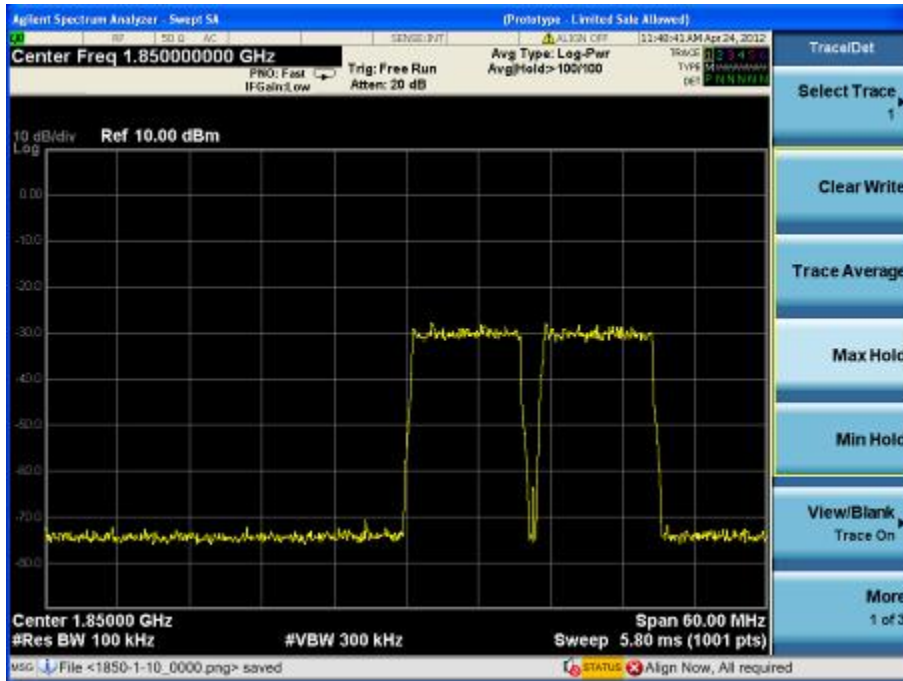
1900MHz-LTE-64QAM down link-Lower Edge



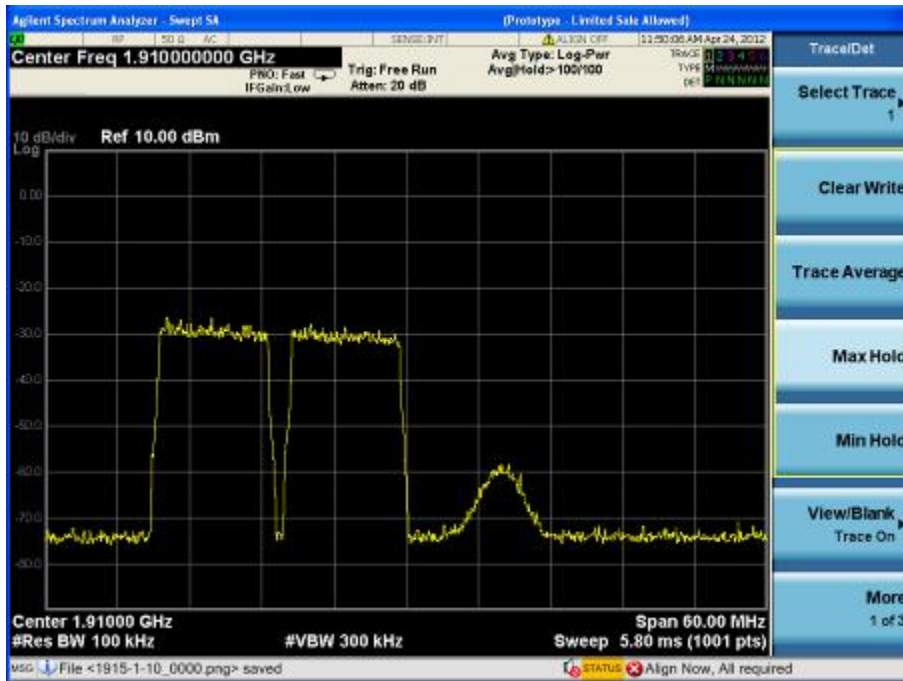
1900MHz-LTE-64QAM down link-Upper Edge



1900MHz-LTE-64QAM up link-Lower Edge



1900MHz-LTE-64QAM up link-Upper Edge



**Remark:**

For the test in two signal input or intermodulation ,test input signal f1 and f2 will consider as follows conditions:

7)EUT frequency band span and the amount of channels;

8)f1 is the frequency lower,f2 is the frequency higher , $\Delta f$  is the channel spacing;

9)in lower edge test, f1 is the lower frequency+1 channel frequency ,and f2 is+2 channel frequency;

10) in higher edge test, f1 is the higher frequency-2 channel frequency ,and f2 is-1 channel frequency;

11)according to the amplifier characteristic ,the 3rd product will appear when two signals input;

12)base the 3rd product frequency  $F1=2F1-F2$ ,and  $F2=2f2-f1$ ,when the f1 and f2 frequency select above,

a)in lower edge test , $F1=2f1-(f1+\Delta f)=f1-\Delta f$ =lower dege frequency;

b) in higher edge test , $F2=2f2-(f1-\Delta f)=f1+\Delta f$ =higher dege frequency

### 4.2.7 OUT OF BAND REJECTION

Test Date:	05 May, 2012
Test Method:	2-11-04/EAB/RF
Test Requirement:	2-11-04/EAB/RF Test for rejection of out of band signals, Filter freq, response plots are acceptable
Specification	The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block ,The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ( $\pm 2.5\text{ppm}$ ) of the center frequency
Status	The output power of EUT be set to maximum value, the gain of EUT be set to maximum value by software through the manufacture
Conditions	Normal conditions
Application	850MHz DL and UL ports, 1900MHz DL and UL ports
Test configuration	

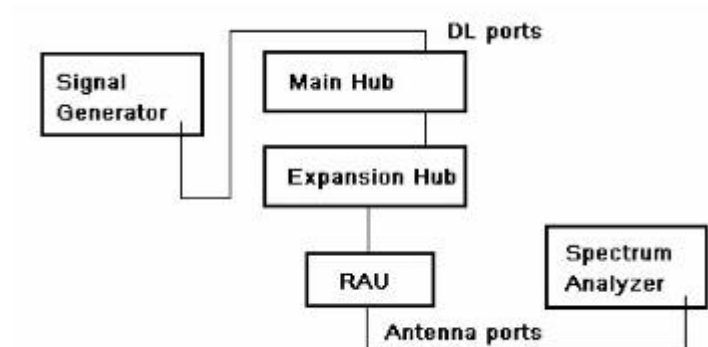


Fig.1 Down Link Configuration

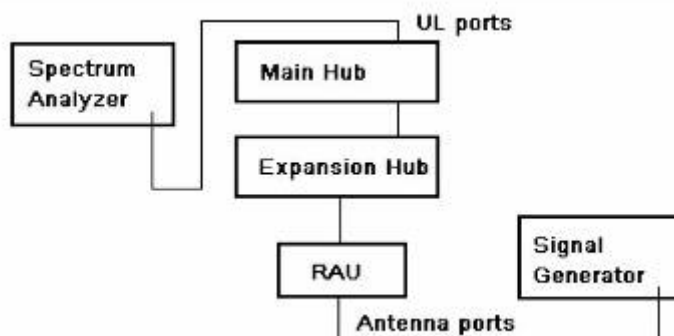


Fig.2 Up Link Configuration

Test procedure

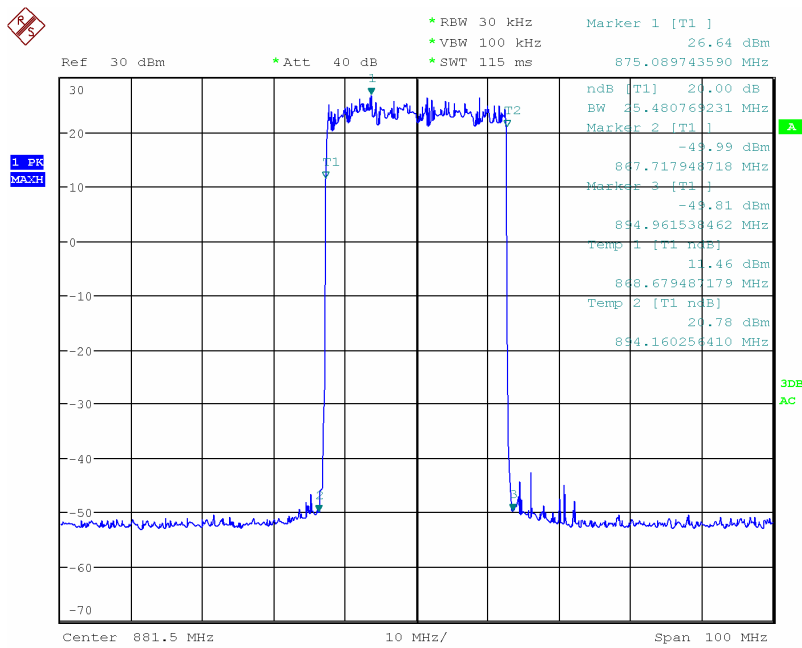
1. Connect the equipment as illustrated;

- 2. Test the background noise level with all the test facilities;
  - 3. Keep one transmitting path, all other connectors shall be connected by normal power or RF leads;
  - 4. Select the attenuator to avoid the test receiver or spectrum analyzer being destroyed;
  - 5. Keep the EUT continuously transmitting in max power;
  - 6. Signal generator sweep from the frequency more lower than the product frequency to the frequency more higher than it, find the product band filter characteristic.
- CW signal rather than typical signal is acceptable (for FM)  
Multiple band filter will need test each other

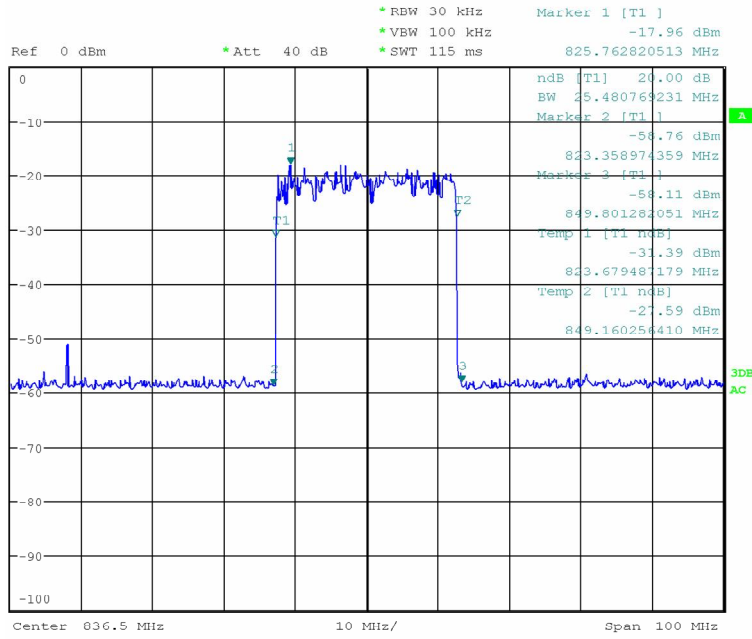
### 4.2.7.1 MEASUREMENT RECORD

#### 850MHz Band

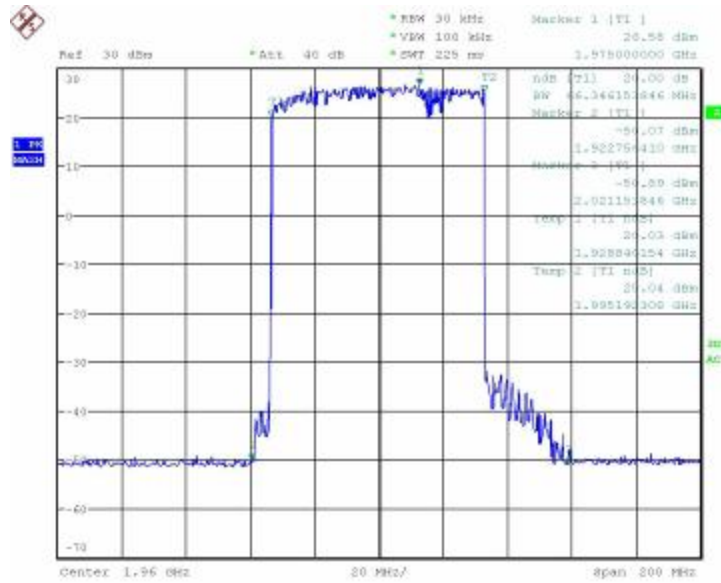
850MHz-down link



850MHz-up link

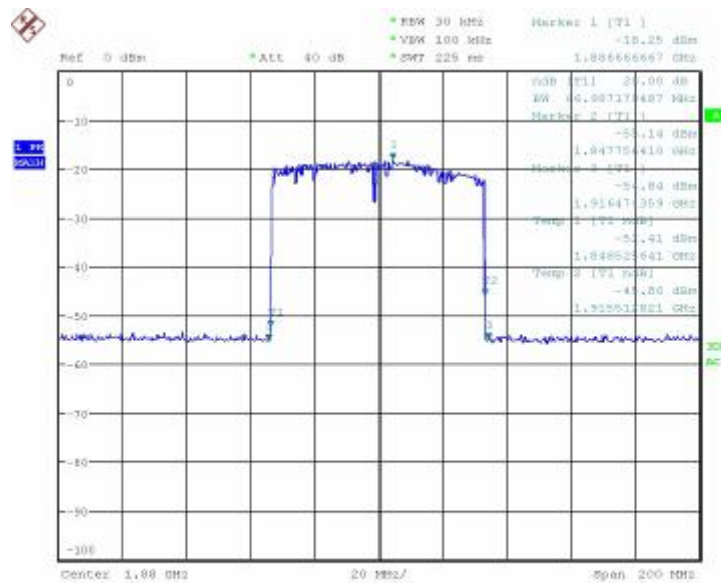


### 1900MHz Band 1900MHz-down link



Date: 24.MAY.2012 10:49:33

### 1900MHz-up link



Date: 24.MAY.2012 11:35:25



## 4.2.8 FREQUENCY STABILITY

Test Date:	05 May, 2012
Test Method:	FCC part 2.1055
Test Requirement:	FCC part 22.355& FCC part 24.235&FCC 27.54
Specification	The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block ,The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ( $\pm 2.5\text{ppm}$ )of the center frequency
Status	The output power of EUT be set to maximum value,the gain of EUT be set to maximum value by software through the manufacture
Conditions	Temperature condition, Voltage condition
Application	850MHz DL and UL ports, 1900MHz DL and UL ports
Test procedure	<ol style="list-style-type: none"><li>1. Temperature conditions:<ol style="list-style-type: none"><li>a)record the 20°C and normal voltage frequency value as reference point;</li><li>b)vary the temperature from -30°C to 60°C with step 10°C</li><li>c)when reach a temperature point ,keep the temperature banlance at least 1 hour to make the product working in this status;</li><li>d)record the frequency at the relative temperature.</li></ol></li><li>2. Voltage condition :<ol style="list-style-type: none"><li>a)record the 20°C and normal voltage frequency value as reference point;</li><li>b)vary the voltage from -15% norminal voltage to +15% voltage</li><li>c)read the frequency at the relative voltage.</li></ol></li></ol>

### 4.2.8.1 MEASUREMENT RECORD

#### 1.Frequency Stability vs temperature

##### 850MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
60	881.500598	0.0030
50	881.500566	-0.0056
40	881.500525	-0.0052
30	881.500583	0.0013
20	881.500571	Reference
10	881.500588	0.0019
0	881.500567	-0.0045
-10	881.500542	-0.0032
-20	881.500551	-0.0022
-30	881.500547	-0.0027

##### 1900MHz

Temperature(°C)	Frequency(MHz)	Tolerance(ppm)
60	1960.000473	0.0045
50	1960.000485	0.0107
40	1960.000472	0.0041
30	1960.000465	0.0005
20	1960.000464	Reference
10	1960.000451	-0.0066
0	1960.000479	0.0076
-10	1960.000497	0.0168
-20	1960.000488	0.0122
-30	1960.000482	0.0091

## 2.Frequency Stability vs voltage

850MHz

Voltage(V )	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	881.500556	-0.0170
120	881.500571	Reference
138(120*1.15)	881.500566	-0.0056

1900MHz

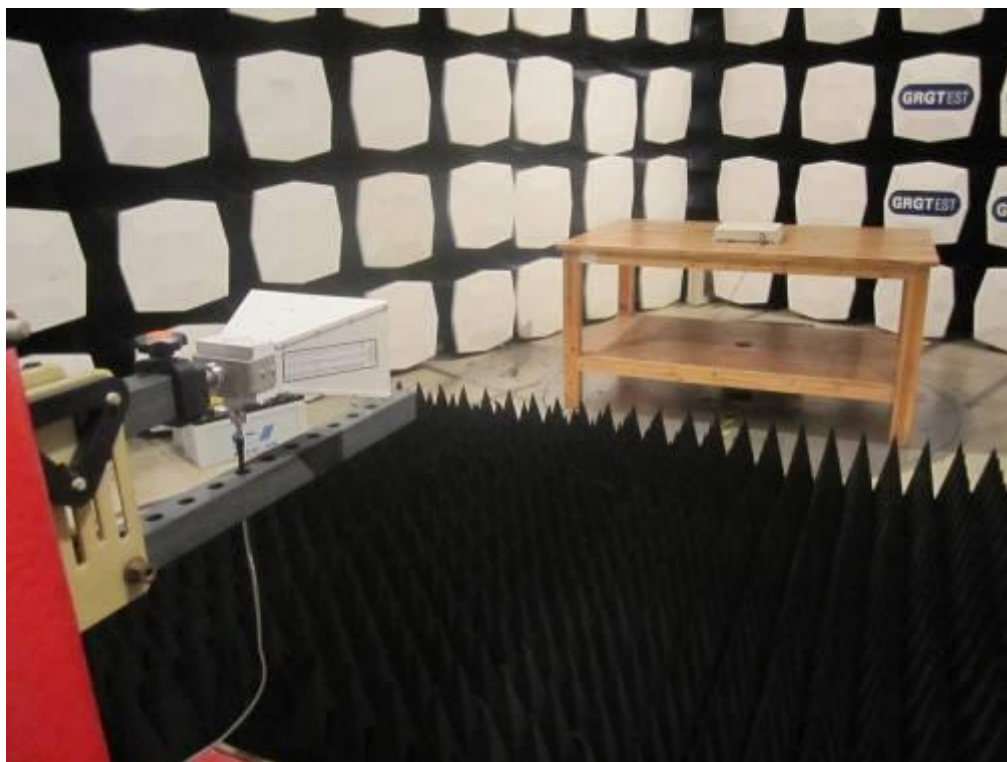
Voltage(V )	Frequency(MHz)	Tolerance(ppm)
102 (120*0.85)	1960.000467	-0.0035
120	1960.000474	Reference
138(120*1.15)	1960.000459	-0.0076

## APPENDIX A: PHOTOGRAPH OF THE TEST CONFIGURATION

RE (Below 1GHz)



RE (Above 1GHz)



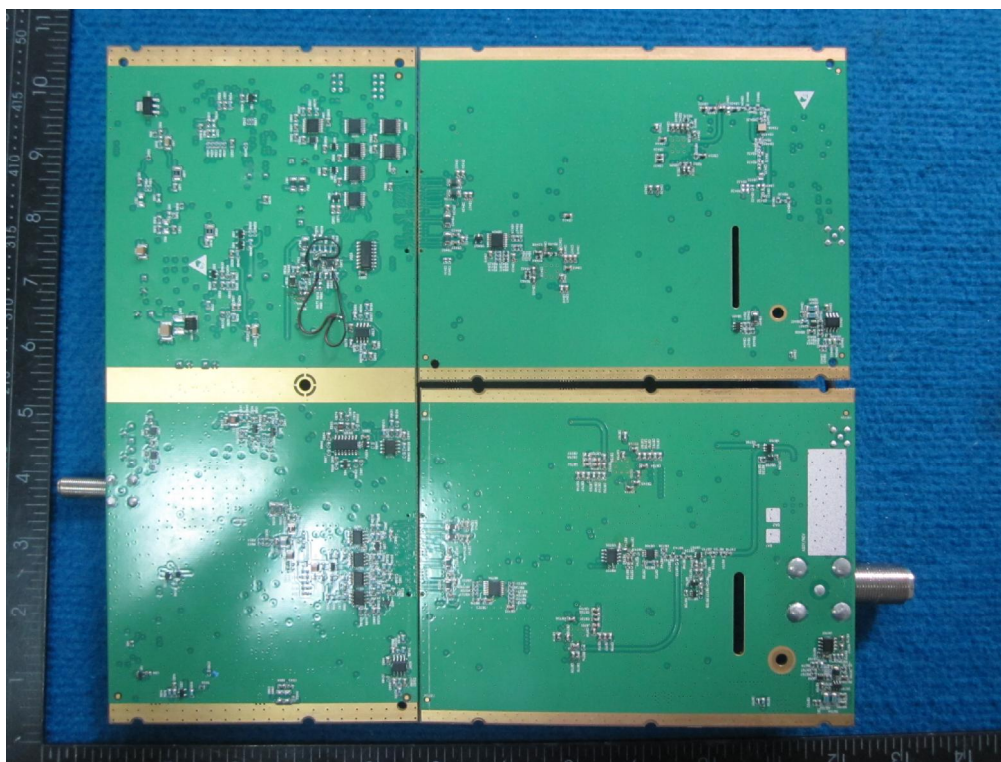
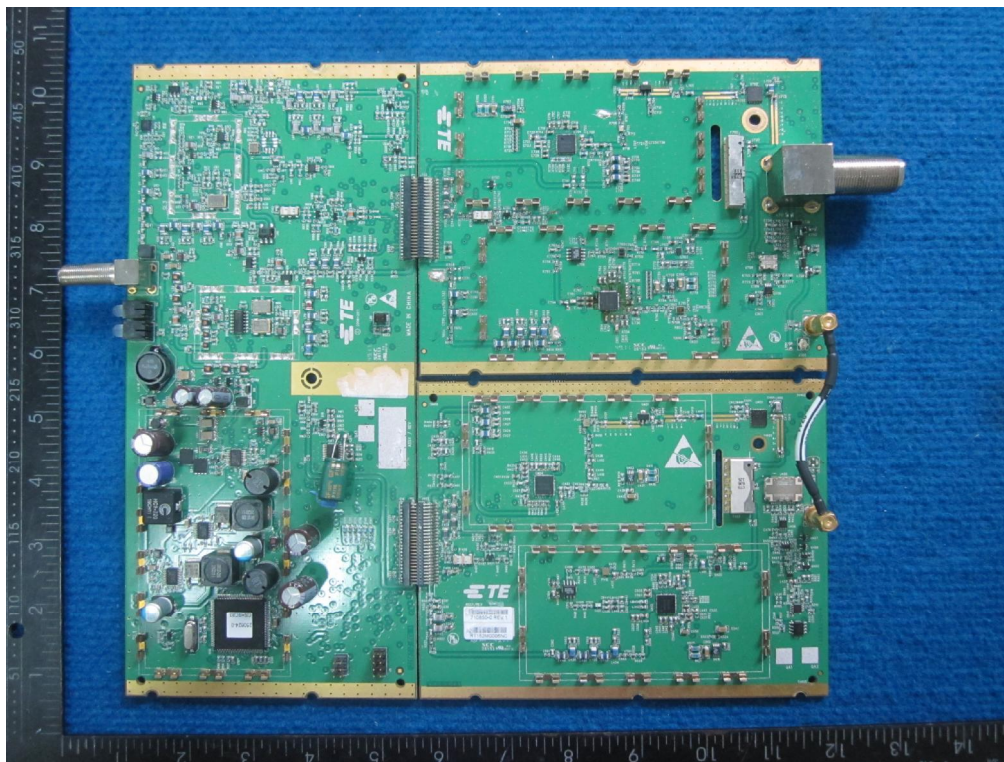
**APPENDIX B: PHOTOGRAPHS OF EUT**











-----This is the last page of the report. -----